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CONTENTS OF PREVIOUS NUMBER

Ringworm of the Scalp in Mexico: Clinical Study. Jr. Gustavo Uruchi, M.D., Mexico City, Mexico.

Pigment (Melanin) Studies of the Human Skin After Application of Thorium X, with Special Reference to the Origin and Function of Dendritic Cells. Samuel M. Peck, M.D., New York.

Leukemycin Sistim: Report of a Congenital Case. R. William Becker, M.D., Chicago.

A Syndrome of Gonorrheal Keratoderma: Report of a Case. Moses Scholtz, M.D., Los Angeles.

Pigmentation of the Skin in Addison's Disease, Acanthosis Nigricans and Hemochromatosis. Hamilton Montgomery, M.D., and Paul A. O'Leary, M.D., Rochester, Minn.

Modern Antisyphilitic Therapy: Disadvantages and Value. A Statistical Study of One Hundred and Ninety-Two Cases of Relatively Late Syphilis, Untreated and Inadequately Treated. Claude B. Nortis, M.D., Youngstown, Ohio.

Paravasic Application of Phenol in Dermatology: Preliminary Report. Friedrich J. A. [illegible]

[illegible] and Syphilology: Dr. A. [illegible], Chicago, Illinois.

[illegible] of the Relationship between Pigment Production and Distribution of Skin: A Review of the Literature. Zola [illegible], Chicago, Illinois.

[illegible] Abraham Arnstein, M.D., and S. Becker Becker, M.D., Chicago, Illinois.

[illegible] Notes and Comments.

[illegible] Transactions:
Brooklyn Dermatological Society.
[illegible] Dermatological Society.
[illegible] and Syphilology.
[illegible] Dermatological Society.
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Archives of Dermatology and Syphilology

VOLUME 22 JULY, 1930 NUMBER 1

TRICHOPHYTON PURPUREUM (BANG) AS A DEEP INVADER OF THE SKIN

REPORT OF A CASE *

JOHN H. HARRIS, M.D.
AND
GEORGE M. LEWIS, M.D.
NEW YORK

Most authorities think that the fungus first described by Castellani, in 1910,[1] as *Epidermophyton rubrum* is identical with *Trichophyton purpureum* (Bang, 1910[2]) and *Trichophyton rubidum* (Priestley, 1917[3]) which were subsequently described. Castellani[4] still considers the fungus that he reported to be an epidermophyton and classifies it as such in his recent articles in the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY. All observers agree that this fungus is a superficial invader, occasionally being found in a wide variety of mycologic conditions, including the macerative and vesicular types of dermatophytosis, tinea cruris, tinea circinata and onychomycosis. We were unable to find any reference in the literature to cases in which this fungus was found to play a part in the production of deep infection or in which the hair follicle was invaded. However, inoculation of guinea-pigs with cultural material was successful in some instances. Bang reported one positive result in five inoculated guinea-pigs. Hodges[5] was also partially successful. Ota[6] obtained positive results in two instances. On the other hand, Castellani did not succeed in inoculating cultures of *Epidermophyton rubrum*.

* Submitted for publication, Oct. 7, 1929.

* From the Department of Dermatology and Syphilology, New York Post-Graduate Medical School and Hospital.

1. Castellani, A.: Observation on a New Species of Epidermophyton Found in Tinea Cruris, Brit. J. Dermat. **22**:147, 1910.

2. Bang, H.: Sur une trichophytie cutanée à grands cercles, causée par un dermatophyte nouveau (Tr. purpurem, Bang), Ann. de dermat. et syph. **1**:229, 1910.

3. Priestley, H.: Ringworm and Allied Parasitic Skin Diseases in Australia, M. J. Australia **2**:471, 1917.

4. Castellani, A.: Fungi and Fungous Diseases, Arch. Dermat. & Syph. **16**:597 (Nov.) 1927.

5. Hodges, R. S.: Ringworm of the Nails, Arch. Dermat. & Syph. **4**:1, (July) 1921.

6. Ota, M.: Contribution to the Study of Trichophyton Purpureum Bang, Trichophyton Interdigitale Priestley and Trichophyton "B" Hodges, Arch. Dermat. & Syph. **5**:693 (June) 1922.

The majority of reports in America that mention *Trichophyton purpureum* originated in the southern states, in which the fungus is a common causal agent in ringworm of the groin and of the toes. It is still rarely found in the eastern states. Weidman,[7] in a personal communication, stated that he recently encountered the organism in a case of ringworm of the groin. Karrenberg [8] reported that it supplanted *Epidermophyton inguinale* in Hamburg but in a later verbal communication to Weidman he said that *E. inguinale* had once more become the common organism.

The following case is reported in support of the contention that the organism is a large-spored ectothrix trichophyton, with the ability, in this instance, to produce a granuloma, albeit its commonest habitat is the superficial epidermis.

REPORT OF A CASE

History.—R. M., a white man, aged 33, a salesman, was born in Texas and lived there until 1924, when he moved to New York. Since that time he had been under the care of one of us for treatment for psoriasis, which he had had sporadically for fifteen years. The family history was unimportant.

On Dec. 1, 1927, he presented himself, complaining of a patch of psoriasis on the side of the neck just to the right of the midline. He received two roentgen treatments at weekly intervals, which resulted in the disappearance of the patch. On Jan. 5, 1928, he again presented himself. At this presentation he had three infiltrated, bean-sized nodules on his neck in the area that was the site of the patch of psoriasis. They were considered pyodermic hair follicle infections, but the condition became worse under treatment. On January 15, there were six of the same type of nodules, and the area was swollen, erythematous and slightly sensitive. There was no fluctuation. On January 20, the clinical appearance had changed. New nodules had formed, and the original ones had fused to form three bandlike granulomas (fig. 1) which were boggy in consistency and dull red. Hairs and pus were removed from the granulomatous areas, and the patient was examined for a possible reservoir of fungi. Macerated tissue was collected from the interdigital webs of the last two interspaces of both feet. The patient said that he had noticed scaling between his toes for over ten years. A section of tissue was removed from the center of one of the nodules for microscopic examination.

Microscopic Observations.—Hairs from the affected area were epilated easily. An extemporaneous preparation, in which 15 per cent potassium hydroxide was used, failed to reveal any fungus in the cortex of numerous hairs examined, but large mycelial chains were found outside the hair-shaft in several specimens. No fungi were demonstrated in pus. Examination of macerated skin from the feet revealed sporulated mycelium of large caliber.

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7. Weidman, F. D.: Laboratory Aspects of Epidemorphotosis, Arch. Dermat. & Syph. **15**:415 (April) 1927.

8. Karrenberg, C. L.: The Present Status of Epidermophytosis in Europe, Arch. Dermat. & Syph. **17**:519 (April) 1928.

Wood Filter.—Neither the affected area nor the epilated hairs taken from this area were fluorescent when exposed to ultraviolet radiation from a water-cooled mercury vapor lamp, screened with a Wood filter.

Cultural Observations.—Culture tubes were inoculated, Sabouraud's mediums being used (substituting crude American dextrose for the crude French maltose but with the same proportion of agar and peptone [Chassaing]). The material planted included hairs from the granulomatous area, pus withdrawn by syringe under sterile precautions and macerated skin from the feet. All three materials returned positive cultures showing identical properties.

Fig. 1.—Bandlike granulomas.

The growth at first was downy white, showing short duvet. Growth was moderately fast. A central knob made its appearance. In two weeks the medium became slightly discolored, gradually assuming the color of port wine. The colony itself continued to be creamy white throughout until it was over a month old, when it, too, became streaked with the same shade of color. At five weeks, the growth covered the entire slant. No characteristic surface configuration was present other than a central knob.

Hanging Drop (Pleomorphic Culture).—At this time no characteristic organs of fructification were present. Several preparations showed branching hyphae bearing a few lateral conidia. No chlamydospores, fuseaux, "grappes" or spirals were noted.

Animal Inoculation.—Inoculation of guinea-pigs gave negative results, which would suggest that the fungus was not a special strain or of increased virulence, but that there was an increased susceptibility for it on the part of the patient.

Pathologic Observations (Dr. Satenstein).—The predominant feature under the low-power magnification, was an intense cellular infiltration, somewhat focal in the upper cutis and more diffuse in the mid and deep cutis, extending down into the fat. This infiltration was more pronounced around the vessels and hair

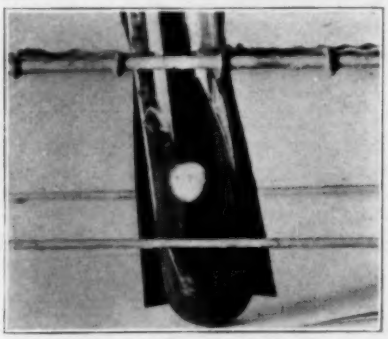

Fig. 2.—Growth of culture in one week.

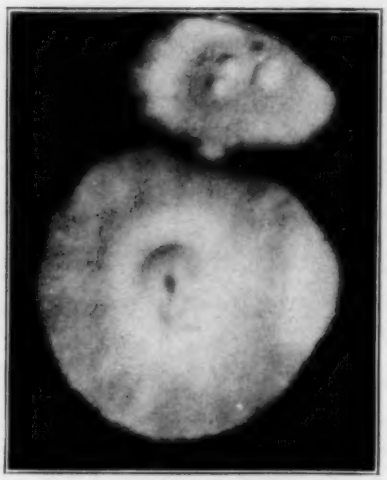

Fig. 3.—Growth at three and one half weeks in a Petri dish.

follicles. The blood vessels and lymphatics in the upper cutis were dilated. There was an interstitial edema of the collagen in the upper cutis and a parenchymatous edema in the mid and deep cutis. The muscle fibers present were in a state of hyaline degeneration. In some of the sections, the collagen bundles in the deep cutis showed evidence of collastin degeneration. In some places, the epidermis was markedly acanthotic, and in other places it was covered by a crust.

In the upper cutis, high-power magnification showed the infiltration predominantly lymphocytic. In the mid and deep cutis, it was a mixture of lymphocytes,

connective tissue and plasma cells. There was also a tremendous increase in the number of mast cells throughout the entire cellular infiltrate. Around the hair follicles were many polymorphonuclear leukocytes. The vessel walls of the upper cutis were edematous, and the nuclei of the endothelium projected into the lumen. The connective tissue in this zone was for the most part dissociated

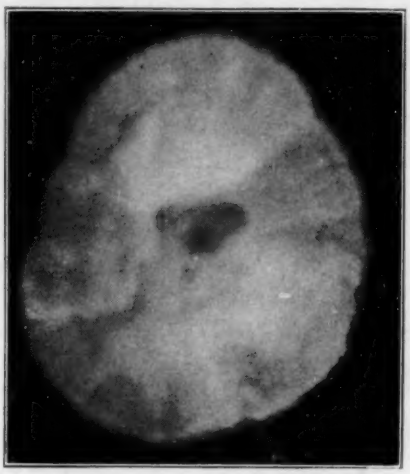

Fig. 4.—Growth in a Petri dish at four weeks. A slight shade of color is shown in the colony.

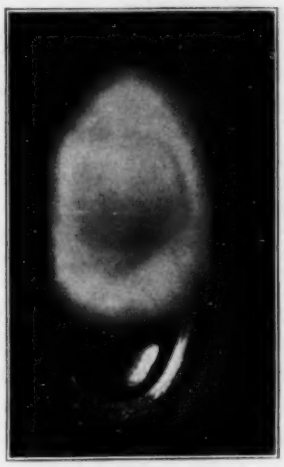

Fig. 5.—Culture in test-tube at four weeks. Medium is discolored, but the colony itself is white. The central umbo present at this stage of the growth is useful in settling the identity of this species.

and granular. In the middle and deep cutis were a great many thin-walled blood vessels (granulation tissue). The walls of the vessels in the deep cutis were markedly swollen and in places showed some hyaline degeneration. The nerve bundles were swollen and degenerated. Under methylene blue (methylthionin chloride, U. S. P.) stain, no organisms could be demonstrated.

Further Notes on the Case.—The patient was not constitutionally ill and remained at work. Under an epilating dose of roentgen rays and sodium iodide by mouth, he made an uneventful recovery in four weeks.

COMMENTS (DR. WEIDMAN)

The interpretation to be placed on this case is that the fungus was transplanted from a reservoir on the feet into a locus resistentia minora (focus of suppuration) on the face, and that once established (really a secondary infection) it introduced a chronic phase into the case and became more resistant against treatment than the primary condition. Analogies to this rationale are not unknown (tuberculosis of children succeeding acute infections of the lungs or even measles; actinomycosis in carious teeth, etc.), but this was probably the first time that such a suspicion was directed at this species. The alternative interpretation is that it was itself the primary invader; this I am rather loathe to believe on account of its essentially superficial invasive capacities; but I acknowledge that the door is still open for demonstration otherwise, as mycologic studies were not made to settle the matter in the earliest days of the granuloma.

Mycologically, there was no difficulty in differentiating this species from the common *Trichophyton rosaceum* of beard ringworm or the powdery *Trichophyton persicolor* or *Trichophyton vinosum*.

The rôle of the preexistent psoriasis also comes into the question, but in the absence of additional data, experimental data particularly, cannot be now speculated on.

CONCLUSIONS

1. *Trichophyton purpureum* (Bang) is an uncommon fungus in the eastern part of the United States.

2. It is essentially a superficial invader.

3. A case is reported showing that it is capable of producing subcutaneous granulomas.

4. We believe the fungus concerned was a large-spored ectothrix trichophyton.

Dr. Fred D. Weidman of Philadelphia helped us to determine the identity of the fungus.

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SIGNIFICANCE OF MYCOLOGY IN TROPICAL MEDICINE *

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SAN JUAN, PORTO RICO

When the eye of man first contemplated the hitherto invisible world of minute plants, a most bewildering vegetation presented itself: plants without chlorophyl that decompose dead organic matter, and form an important link in the chain of life itself; plants that prey on vegetation that embellishes homes and furnishes food; plants that have finally left their natural habitat and seek their sustenance directly by parasiting man.

Into this garden of flowers stepped the great master, Pasteur. Lingering but a short while in contemplation of the relatively large fungi, the yeasts, he quickly scented the haunts of man's greatest enemies, the tiny bacteria. And from that day to this, men have been treading the paths that run here and there through this apparently limitless labyrinth of strange vegetation to search out and to destroy these, the least in size and development, yet the greatest in power for evil. It is only within the last ten or twenty years that the medical sciences have paused long enough in their struggle with the more deadly bacteria to view with suspicion the marvelous variety of flowering plants of a higher order, the fungi, also the product of this garden, which are at times capable of leaving their peaceful vegetative life and attacking man.

Long before bacteriology became a science, explorers had wandered about in this jungle. Their sharp eyes had picked out the larger, the more striking plants, and had named them in the vernacular of ancient science according to peculiarities, usually morphologic. Later, with the earliest and crudest microscopes in their hands, smaller flowers were spied and also named.

Thus was mycology born. By the time medical mycology came into being not quite a hundred years ago, its mother science presented a list of species—classified and described as well as the clumsy instruments and primitive knowledge of the times would permit—so vast as to chill the blood of the most ardent scientist.

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* Submitted for publication, April 10, 1930.

* Kober Foundation Lecture, delivered at Gaston Hall, Georgetown University, Washington, D. C., March 28, 1930.

To the medical profession belongs the honor of inheriting from the ancient science of mycology a goodly part of that heterogenous tangle known as the *"Fungi imperfecti,"* a problem as yet not entirely solved. Therein lie the majority of the pathogens.

The medical sciences try to apply their knowledge to the upbuilding of a more perfect and a more efficient man, at least, from a physical standpoint. May the pure science of mycology aid in securing a better classification of the knowledge of pathogenic fungi, for without organization progress is slow, costly and often fallacious. The medical profession is perfectly willing to perpetuate early and glorious names in the development of this science, but it is loathe to perpetuate their mistakes or their indefinite genera and species on which to build for the future.

On the other hand, it must be recognized that in the enthusiasm of opening a new field, medical men create new species and even genera at too great a velocity, often at the same time persisting in a habit of thought long since abandoned by themselves in the more perfected science of bacteriology, namely, that of jumping at the conclusion that an organism found in some lesion, often a banal one, is the etiologic agent, chiefly because no other cause seems apparent. In fingering the pages of a textbook on medical mycology, it is discouraging to read long taxonomic discussions and laboratory detail on some supposedly pathogenic fungus, and to find at the end that the organism discovered ten, twenty or thirty years ago has never been seen again, that the original culture was lost, and either that experimental proof of pathogenicity was negative or that inadequate or defective methods had been used. No one will deny that some one's observation has to be the first, and that publication of such work stimulates investigation, but it is confusing and depressing to a busy profession to include in a work-a-day guide to the practice of medicine a fungus with an imposing name and a mass of complicated laboratory data dragging but one doubtful victim behind it.

As a matter of fact, and this is where the botanist and the plant pathologist are helping, what is being described as two, three or more separate species, or even genera, may be merely phases of one. Shear and Dodge have done some revolutionary work in mating two apparently similar monospore cultures to obtain a third which differs from either one. Blakeslee's homothallism and heterothallism and Link's treatment of fungi by ultraviolet rays seem almost sure to reduce the actual number of species as well as to provide more reliable standards.

There are many distinct differences between mycology and bacteriology. In general terms, the bacteria are more aggressive, better adapted to parasitize man. The bacteria which so largely figure in medicine are normally parasitic. The fungi, however, are normally saprophytic and

only at times invade man. This, however, depends somewhat on the genus: *Trichophyton, Microsporon* and *Achorion* of Sabouraud seem to have finally adopted a parasitic existence in man and animals; *Aspergillus, Sterigmatocystis* and *Penicillium* lie near the other extreme. Nevertheless, when the fungi do actually adapt themselves to man they become formidable parasites. At times, they may merely convert a disordered physiologic condition into a disease, as I think is the case in sprue. In this case, it is difficult to call them "secondary invaders," because there is no proved primary one. They merely colonize in terrain which disordered function provides, and subtly paint a clinical picture. Thus the study of pathogenic fungi with their closer relation to saprophytic forms is apt to throw more light on such problems in bacteriology as polymorphism, to mention only one.

Another hope that mycology offers is that it will probably teach a great deal more about the nature and importance of terrain in the successful parasitism of man in any slow-going infection. Many of these problems in mycology are today completely unsolved. Why do certain so-called "*Trichophytons* of human origin" ravage the hair of children while they do not attack persons over 15 years of age? A favorable terrain is one of the most important factors in the invasion of man by fungi.

The macroscopic appearance of a culture of fungi has far greater importance in classification than that of bacterial cultures. Not only is this true, but morphology, protean as it is, is an indispensable factor. On the other hand, immunology has not as yet seemed to be as applicable to diagnosis of fungous diseases, chiefly through its more sweeping group reactions. Surely no one can deny that bacteriologic technic alone is insufficient for the mycologist, nor that animal experimentation is not so decisive.

The importance of mycology in tropical medicine is becoming more and more apparent in medical journals, societies and congresses. Schools of tropical medicine today are incomplete without a department of mycology. It is believed premature to fix on a definite percentage of diseases caused by fungi in the tropics. I feel with Dr. Beatrice Kesten, who made a survey of about 700 dermatologic cases in Porto Rico, and all of whose cultures I studied, that at least a third, and perhaps a half, of the skin diseases seen in clinics there are mycotic. But, with the exception of tropical sprue, fungi are really infrequent causes of death or serious disease. As a matter of fact, the diseases usually seen in fairly well sanitated tropical lands are not tropical. Nevertheless, it must not be forgotten that skin diseases during the Great War were at times nearly, if not quite, the most important factor in disabling men for active duty at the front.

With these words of introduction, I hope to be pardoned if I do what, after all, is the obvious thing, namely, rapidly review the mycologic field which opens before scientific physicians in tropical countries to the end that their friends in temperate climates may help them or, if they cannot help, at least feel sorry for them.

THE BLASTOMYCOSES

In this group are found the most dangerous pathogens for man, with the exception of the relatively rare diseases due to *Microsiphonata.*

The term is not very scientific, for there is no accepted order or family of *Blastomycetes.* The genus *Blastomyces* was created for a filamentous organism which has no connection with yeastlike fungi. But to clinicians it has come to have a definite meaning, and should stand with others like it as a monument of warning to those who are

Fig. 1.—Giant subculture of Trichophyton sulphureum received in a pleomorphic condition three years before this picture was taken. The whole surface is snow white. Author's medium. This culture has been growing thirty-nine days. (Photograph by Prof. P. Morales Otero.)

bent on designating disease processes according to a nomenclature which is being constantly invalidated by the rapidly developing and hence unstable science of mycology. It will be construed as a pathologic condition due to yeasts or filamentous fungi producing yeastlike elements.

Strictly speaking, a yeast can reproduce by the ascus, or a mother cell containing spores, and does not produce filaments. *Torula* and *Cryptococcus* do not sporulate, and nonmedical mycologists refuse to accept the term *Cryptococcus.* The best classification seems to be that of Redaelli and Ciferri, who unite all asporous yeastlike organisms, *Torula, Monilia* and *Mycoderma,* under the family *Torulopsidaceae.* When *Saccharomycetaceae* and *Endomycetaceae* are added to this family, about all of the organisms have been embraced which should be included in the term *"Blastomycetes."* In reality, the term is used in a medical

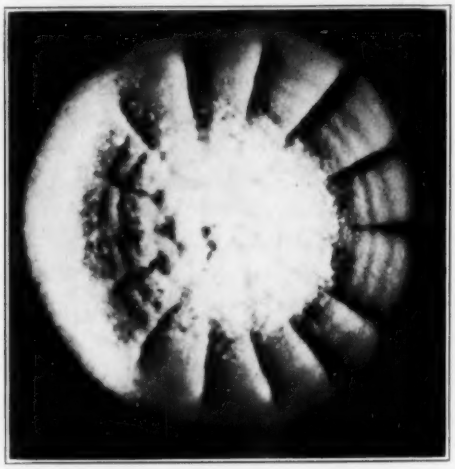

Fig. 2.—On the same day and in the same batch of medium the same strain was sown but the culture was exposed every five days to ultraviolet rays for one and a half minutes and resown in fresh mediums in twenty-four hours. This picture was made two weeks after the last exposure or fifth transfer. During the exposures to the rays the cover of the Petri dish was replaced by one of quartz glass. The unduvetted and radially furrowed border has a salmon-sulphur yellow color. The center and part of the rim are covered by a powder duvet. (Photograph by Prof. P. Morales Otero.)

Fig. 3.—Gelatin stab of Monilia psilosis. (Photograph made in Institute of Tropical Medicine and Hygiene of Porto Rico.)

sense, as a rule, to designate only the serious diseases caused by certain species of *Cryptococcus* and *Coccidioides.*

It is almost worth while flouting the power and might of the high priests of botany to prefer "blastomycosis" to saccharo-endomycetotorulopsidaciosis.

This detail is given in order to demonstrate to what mutual incertitude the medical and botanical sciences are subjected.

For such reasons as these and many others, an International Congress of Mycology with a distinct section devoted to medical mycology is badly needed. If such a congress could outlaw such of these unjustifiable substitutes for ancient, and, it is true, often very vague families, subfamilies, genera and subgenera, the medical profession would know on what it could depend. In fact, there is hardly a term borrowed from mycology to designate a mycosis that is not severely arraigned by botanists who themselves are not wholly innocent in producing the confusion.

Saccharomycetaceae or True Yeasts.—Only four genera of the twelve contain pathogens, *Debaryomyces, Saccharomyces, Willia* (rarely) and *Schizosaccharomyces.* Species of these genera have been found in generalized epidermomycoses, interdigital mycoses, onychomycoses, tonsillomycoses resembling diphtheria, sycosis, bronchopulmonary mycoses and generalized or localized subcutaneous blastomycoses of serious type. One of the most interesting genera, recently shown to be the cause of eczematoid lesions in eighteen cases, is *Schizosaccharomyces hominis* Benedek, 1927.

In general, however, *Saccharomycetaceae* cannot yet be considered to be very prevalent pathogens. No true yeast infections of the skin have as yet been observed in Porto Rico, and of 781 cultures of fungi recovered from the feces of 694 persons, only 23, or about 3 per cent, yielded *Saccharomycetaceae,* all apparently nonpathogenic.

Most of the so-called pathogenic species have been found merely once or twice in disease processes and piously endorsed on from treatise to treatise in "exhaustive" medical works, especially dermatophytes.

Endomycetaceae or Ascus-Producing Filamentous Yeasts.—*E. albicans* or *E. vuillemini,* a cause of thrush, is another object of veneration to most writers of textbook articles. As a matter of fact, *Endomyces* must be a rare organism in the tropics. I have never seen *E. albicans* and, in fact, have found only one of the family in the stools of over 3,000 persons.

Torulopsidaceae or Asporogenus Yeasts With or Without Filaments.—Genus *Cryptococcus:* The organism is usually described as a double-contoured, rather large, round or oval yeast, without a prominent oil drop and without mycelium. The botanists, almost to a man, have

failed to recognize this genus, which they consider to belong to the genus *Torula* in the Pasteur-Hansen sense.

The following are some of the bad pathogens:

Cryptococcus hominis Vuillemin, 1901, producing a blastomycosis of the type Busse-Buschke; *Cryptococcus capsulatus* Darling, 1906, causing the fatal histoplasmosis of this author, and *Cryptococcus histolyticus* Stoddard and Cutler, 1916, causing a mycotic cerebrospinal meningitis. It will be noted that *C. dermatitidis* of Gilchrist, a serious human pathogen, and *C. farciminosus* of Rivolta and Micellone, the cause of epizootic lymphangitis of horses, have been omitted. The first is not a tropical fungus, and in addition is not a *Cryptococcus,* according to Langeron, but a *Mycoderma;* the second is a *Grubyella,* according to Ota.

Genus *Mycoderma:* These organisms are really *Arthrosporineae,* because the yeastlike elements they produce are merely segments of the filament or hypha; but they are considered as causal agents of blastomycoses and contain important species producing certain of these diseases. These fungi are improperly referred to as belonging to the genus *Oidium.* This genus should indeed disappear from medical mycology, as well as the genus *Oospora.* The first is strictly an *Ascomycete,* parasitic on plants; the second, synonymous with Vuillemin's *Microsiphonata.*

Langeron classes here: *M. brasiliensis* Splendore, 1912, causing a most serious and frequent blastomycosis, affecting skin and mucous membranes in Brazil; *M. immite* Rixford and Gilchrist, 1897, the cause of a serious "coccidioidosis" of the skin, known as Posadas' disease in South America.

It should be mentioned that *Mycoderma pulmoneum* Bennett, 1842, said to produce an ulcerating dermatitis and pulmonary lesions, is a common denizen of the intestinal canal in Porto Rico and seems to be entirely harmless. On the other hand, Castellani, with considerable reason, erects the new genus *Blastomycoides* and places therein not only *M. immite* and *M. dermatitidis* but also a new species, *Blastomycoides tularensis* Castellani.

The organism formerly known as *Coccidioides* (now *Blastomycoides*) *immitis* causes a serious skin disease in South America, with mucous membrane and visceral generalization, particularly in Brazil, where, as a member of the Rockefeller Medical Expedition in 1916, I saw several cases. It is feared as though it were cancer and, I was told, is fairly common. Da Fonseca has eleborated an exceedingly delicate skin test for its diagnosis.

Genus *Monilia* and the Moniliases: Here is another medical term likely to become a bone of contention between botanists and medical men. The name was given by Persoon to a nonbudding filamentous

organism generally pathogenic for plants and not fermenting sugars. Vuillemin took *Monilia* of Gmelin as the medical genus and defined it as a budding filamentous organism fermenting sugars and generally pathogenic for man. Berkehout solved the difficulty by giving *Monilia* Persoon the right of way, according to its priority, and changed the medical genus to *Candida.*

Now this is all very well for botanists, but the medical profession is becoming steadily saddled with an incorrect generic name which since 1913 has popularized in medical literature. Again it is necessary to await some international convention to which the medical sciences will subscribe before adopting Berkehout's name, which is very reasonable.

But the difficulty over the generic name is nothing to the confusion produced by Castellani's insistence on making sugar fermentations the principal, if not the only, criterion for specific rank. I have found no papers of his previous to 1914 giving any outstanding specific morphologic or serologic difference between most of the twenty-seven species he has tabulated as to their biochemical qualities. Eleven of these species are a matter of serious doubt to me—and my admiration for Professor Castellani's accomplishments in tropical mycology has been publicly expressed—but five of them, *bronchialis, enterica, pinoyi* and *rhoi,* and recently *metalondinensis,* are firmly believed to be merely *M. psilosis* which has repeatedly counterfeited these biochemical reactions and has returned to its characteristic behavior on subsequent cultures or after passage. As these five species were created practically only on their sugar reactions, and as it is maintained that such grounds alone are insufficient to entitle them to specificity, I believe that they should be absorbed by *M. psilosis,* which from the first has been clearly delimited morphologically, biochemically and serologically, as well as by animal experimentation. Indeed, Castellani is quite right in considering that *M. albicans* Robin, 1853, is a plurality of species. I feel that one of those species, the one, to my mind, which is certainly pathogenic, is *M. psilosis.* In such a case, my own species, the fruit of seventeen years of labor, would fall into synonomy, but there would be something definite at last and not such a cloud of species and of uncertainty.

This does not mean that sugar reactions are of little value in diagnosis, but this factor can be of use only when taken in conjunction with others, as is well recognized by bacteriologists. I use this biochemical reaction myself in distinguishing *M. psilosis* from *M. parapsilosis,* but not alone. Morphology and microscopic appearance of the growth on Sabouraud dextrose agar does have something to do with the question of species, although the establishment of a fairly definite morphology for this little masquerader of nearly 80 years of age takes time, patience and a large number of strains. Her marvelous adeptness in wriggling

past the morphologic barriers laid up for her will certainly serve her quite as well for erratic behavior in sugar solutions.

The Blastomycoses of the Skin.—A great variety of skin lesions are now being attributed to the organisms I have just described. In fact, there is hardly any skin lesion which fungi will not produce or, at least, take part in producing.

A number of cases of moniliasis of the skin and nails have been reported: erosio interdigitalis blastomycetica, eczematoid eruptions of the face, scalp and body (in one case the patient died of sore mouth and diarrhea), paronychia, etc. I personally examined the cultures of *Monilia* found by Thienes, who reported an occupational paronychia among fruit-canners in Wisconsin.

Much the same distribution can be made, although in less degree, for *Cryptococcus* and certain *Saccharomycetaceae*. These lesions are generally superficial.

Posadas' disease, or "coccidioidosis," is a curious condition of the skin caused, as has been seen, by *M. immitis* (*Blastomycoides immitis*). Beginning by multiple papules, these become pustules, and later cutaneous gummas appear. From this stage on, the disease becomes generalized; the lungs, liver, spleen and kidneys and even bones are invaded, and cachexia and death ensue without at any time an adequate check being possible to stay its progress. In the lesions, spherical bodies of thick enveloping membrane and from 3 to 80 mm. in diameter are found in the pus of the gummas and its surrounding tissues. These bodies fill with round bodies like spores, from 3 to 6 mm. in diameter.

Thrush: Until thrush is experimentally produced by a number of species of *Monilia, Mycoderma, Cryptococcus, Willia, Hemispora* and *E. vuillemini* said to be capable of causing it, there will remain considerable confusion. One thing is certain: thrush is not common in Porto Rico. I have seen it only a few times in about thirty years. If *M. psilosis* is the pathogen in thrush, why does it not produce the customary membrane? It is usually found on a stripped, raw tongue.

Tonsillomycoses: This disease is acute and is often taken for diphtheria. Here again *Monilia, Saccharomyces, Cryptococcus, Mycoderma, Willia* and *Hemispora*, as well as *Aspergillus* and *Penicillium*, are accused of being the etiologic agent, apparently simply because they are found there. However, I believe that *Monilia psilosis* is a common cause of acute tonsillitis in Porto Rico.

Prof. P. Morales Otero of the School of Tropical Medicine of Porto Rico studied the flora of 100 cases of tonsillitis, 52 of which were diphtheria, and referred the 7 which were positive for fungi to me for diagnosis. In six cases, *M. psilosis* was found and in one, *M. parapsilosis*. No other organism could be found to account for the disease.

Buccal and Labial Blastomycosis: *Monilia psilosis* can and does invade the lips, buccal mucous membrane, palate and pharynx, but the disease is benign. The grave buccopharyngeal diseases are produced by several fungi, but *Mycoderma brasiliense* is the most important, and the clinical history makes one think of the sufferings of a patient with cancer of these parts. The vagina and rectum are frequently attacked by *M. psilosis,* sometimes severely, with pruritus and burning. Other fungus organisms have also been found.

Keratites and conjunctivitis have been reported due to yeasts, and the eye is often terminally involved in generalized blastomycosis.

Moniliasis of the Lung: Castellani's work on this localization of *Monilia* is a classic. The signs and symptoms are like those of pulmonary tuberculosis. Roentgenograms are apt to show only widening of the hilus and opacity at the base of the lungs. These cases are apt to be fatal. One of my patients, a well-to-do American, had the following interesting history: He consulted me for a corroboration of a diagnosis of hookworm disease, and, as I was making routine stool cultures for fungi, I found *M. psilosis* but no hookworm. As he had a normal digestive tract and came to me because of the insult to his robust health implied by a diagnosis of hookworm disease, my report on the presence of *M. psilosis* was not soothing to his feelings. A month later, he went to the United States on a visit, and in two months more cabled for advice, as a severe case of sprue had developed. On his return, in response to my cable, he weighed about 40 pounds (18.1 Kg.) less and was in a cachectic state, but he recovered rapidly under treatment. The next thing I knew of him was that he had been taken to the hospital with a diagnosis of abscess of the lung. Cultures made from the lung at operation were loaded with *M. psilosis.* It was not an abscess, but a tuberculoid consolidation of the lungs of the type described by Boggs at Johns Hopkins in 1915, in which an identical organism was found. He recovered completely from the lung condition, but died about six months later of typical sprue. Another case of bronchomoniliasis, from the Presbyterian Hospital, was described by Galbreath and Weiss as due to *M. psilosis;* nevertheless, this localization is certainly not common in the tropics, at least (and of all places!) in Porto Rico.

Magrou of the Institut Pasteur reported a case due to "*M. albicans*" in which the agglomerations of fungi were surrounded by rayed clubs as in actinomycosis.

According to Grossi and Balog, the disease is rather frequent in Egypt, but on my recent visit to hospitals there, I did not see or hear of a case of sprue. Redaelli did the laboratory work in these cases and reported an organism which he denominated *Monilia pinoyi,* but which from his description was indistinguishable from *M. psilosis.*

Living *Monilia* vaccines were successfully used in treatment, according to the author; they produced a sharp local reaction.

Castellani found blastomycosis of the lung to be due to *Monilia, Cryptococcus, Saccharomyces* and *Endomyces.* He stated that only certain *Monilia* have the power to cause bronchomoniliasis, and he considers as proof thereof the results of injection of cultures of these special species directly into the lung. But I find that injection of *Monilia psilosis* into the peritoneum or the vein practically always produces white nodules in the lung or moniliasis septicemia with pneumonia.

Langeron established a good case against *Saccharomyces etiennei* in a case of pulmonary saccharomycosis of Poiron.

Magalhães described *Monilia brasiliensis,* which is extremely virulent for the lung, and which rapidly ends fatally in pseudotuberculosis. This organism is so virulent for animals as to produce a rapidly fatal infection when the culture is simply daubed on the mucous membranes. The cultures have a chamois color on Sabouraud agar.

Gastro-intestinal mycoses: Sprue is a disease usually based on a nutritional unbalance, which depresses the function of glands of digestion and brings about a terrain propitious for the colonization of *Monilia psilosis.* This organism is believed to be the etiologic factor which justifies the classification of sprue as an infectious disease. It is a perfect example of the dictum that the fungi usually require a favorable terrain in order to be able to adapt themselves to a parasitic life in man. In a small percentage of cases sprue is apparently produced by main force of infection.

The organism is sufficiently well known to warrant an elision of laboratory data. In Porto Rico, where sprue is extremely common, the apparently healthy carrier does not seem to exceed 5 or 6 per cent. On the other hand, in over 85 per cent of those cases diagnosed sprue, *Monilia psilosis* can be cultivated from the stools.

The outstanding clinical picture is a sore tongue with destruction of papillae, burning in the epigastrium, great excess of intestinal gas, light-colored, foamy stools, an average loss of 20 per cent in weight and a terminal cachexia, often with pernicious anemia, generally hypoplastic.

Askanazy attributed to *Monilia albicans* the rôle of a secondary invader in gastric ulcer, impeding the cicatrization of the same. For many years I have considered *M. psilosis* to play a similar rôle in the duodenal ulcer of sprue, a not uncommon complication. The liver in sprue is decidedly atrophied and may play an important part in the frequent terminal anemia of pernicious type.

Generalized Blastomycoses: *Monilia,* some cryptococci and *Blastomycoides* produce true septicemia with secondary foci in all organs of importance. The prognosis is gloomy.

Adenomyces cruzi is said to produce Hodgkin's disease, and *Proteomyces infestans*, a generalized blastomycosis. I passed some time in Ezequiel Diaz' laboratory in Bello Horizonte in Brazil and saw his cultures. With a clear recollection of their cultural characteristics, I suspect that they pertain to *Mucoraceae*. It would be unprecedented that such an organism could produce a disease of this nature.

THE DERMATOMYCOSES

Dermatophytes.—These organisms are *Hyphomycetes;* order, *Conidiosporales;* suborder, *Closterosporeae*. Sabouraud can fairly be said to be the father of mycology in medicine, for it was he who first classified these organisms for the medical sciences, but his terminology was that of a dermatologist. He divided them into *Trichophyton, Microsporon* and *Achorion*, genera of his own, and *Endodermophyton* Castellani and *Epidermophyton* Lang. Much of his classification had to do with their anatomic position in the body and their parasitic morphology in the tissues.

Langeron and Ota, feeling that the classification should rest on botanical bases, dismembered these genera and distributed Sabouraud's species throughout six genera, preserving his original terminology for three and adding three new ones, *Sabouraudites, Grubyella* and *Bodinia*. To cite an excellent illustration demonstrating the necessity for this change, Castellani's *Epidermophyton rubrum* is totally different from the type species, *Epidermophyton cruris* Castellani, 1905, the chief cause of Dhobie itch, and generically belongs to the old trichophytons. But this organism never attacks the hair, and always attacks the glabrous skin; hence it is an *Epidermophyton* in a clinical sense, but not botanically.

Sabouraud's retort to all of this is that he would welcome a scientific classification in the place of his own provided it were stable, but as no laboratory can stabilize these organisms, an attempt to clarify their morphology on one set of mediums results only in more confusion, as the same organism on other mediums becomes morphologically discordant.

Langeron's last point of view is peculiarly felicitous. He explains that pathogenic fungi with widely differing saprophytic characteristics (and all such fungi in a natural state are saprophytic) when subjected to the same resistance offered by the human organism tend to converge in their morphologic characteristics. This is an example of what Vergue has termed epharmony, and it affects the vegetative, not the hereditary, characteristics. The latter should be made to come out in culture in order that one might classify fungi according to natural science. He also stated that almost every one has failed to grasp the difference between a key to classification and a natural classification.

The inference is that Sabouraud's classification is valuable as a key to the real saprophytic and botanical classification.

Thus the superficial spectator who might be tempted to term a struggle over fundamentals a squabble between scientists must finally recognize it as a clash between highly cultured minds on issues which are to determine the development of a nascent science with an unfathomable future. The real facts are as Sabouraud has stated. It is a matter of standardization, and of restoring the normal saprophytic characteristics of these pathogens. Fungi of this type, with few exceptions, when grown on artificial mediums, become pleomorphic; that is to say, they lose the power of normal reproduction by which they are generically and specifically recognized, and degenerate into fungi that reproduce indefinitely by multiplication of hyphae. This causes an overgrowth of a downy or hairy covering, usually snow white, which is known as a duvet. Once a dermatophyte becomes duvetted, it is lost as far as recognition of its nature is concerned, although it still remains inoculable.

Weideman stated that what mycologists most need to do is to work out fundamental questions in mycology. I am entirely in agreement with him.

From time immemorial it has been said that no one has ever been able to return a pleomorphic organism to its original and normal state, that it is fixed forever in its new state and that it has permanently lost its personality. But can this be true?

The solving of this problem probably will reduce considerably the number of species extant as well as give more reliable morphologic and cultural standards. According to a rumor that George K. Link of the department of botany of the University of Chicago had accomplished this reversal to type for plant pathogens, I have begun to work on the question with my own methods, and while I am as yet in no position to say that I have succeeded, I can at least say that ultraviolet light and frequent transfers on a medium containing carrot, autolyzed yeast, banana, glycerin, peptone, diphosphate of potassium, sodium chloride, sulphate of magnesium and calcium chloride have brought about a radical change in the appearance of these cultures.

Another fundamental question concerns the standard artificial mediums in which these organisms are to be grown. They are so ridiculously capricious in their reaction to the most insignificant changes in temperature, p_H, and food components as to astonish the uninitiated. It is well known that Chassaing peptone is the one make that will bring most of these organisms to the development that formed the basis for their original description, and the worst of it is that the medium must often change radically in its other components according to the genus and even the species. For instance, growth of *Microsiphonata,* principally *Actinomyces,* on ordinary Sabouraud mediums is often miserable,

but on mediums containing calcium malate or sodium asparaginate and glycerin are exuberant, and fine color effects are produced. *Aspergillus* does best on Raulin's synthetic mediums, but *Monilia* pine away in it.

The third problem is that of standard technic. It is a fact that most casual workers in mycology follow no generally accepted technic. Even the taking of material for culture is not standardized. Some scrape the unwashed skin—I hope there are not many such. Some wash the skin with alcohol and ether before scraping it, and some leave the scrapings in alcohol for as long as half an hour before sowing them. It is believed very important to scrub the part with soap and water before using alcohol and ether, and to use two sterile petri dishes, one to collect the superficial scrapings and one, the deep scrapings. The etiologic relation of the organism to the disease is greatly strengthened by finding it in quantity in the epidermal scales but it is really astonishing to realize how many neglect this important step.

I should like to refer to the technic of producing dermatomycoses in animals. In a recent experiment undertaken by Dr. E. B. McKinley and myself at the School of Tropical Medicine, etherized monkeys were inoculated with a heavy emulsion of a virulent culture of *Trichophyton gypseum-asteroides* received personally by me from Sabouraud in Paris. Injections were made hypodermically into both axillae and into the groin, and a flap was raised from the shaved belly on one side, into which an enormous piece of a giant culture was tucked. The wound was then sealed by collodion. On the other side of the abdomen, the skin was sand-papered until a serosanguinolent surface was obtained, and the same emulsion was rubbed in. In all cases, only the sand-papered areas were successful.

In this connection the notable work of Fried and Segal should be recorded. These authors scarified a large area on the shaved belly of rabbits with sand paper and injected into the marginal vein of the ear an emulsion of *Trichophyton gypseum* passed many times through guinea-pigs and stained through gauze. The emulsion showed from 30 to 50 spores per field, and from 2 to 4 cm. were injected. Of twenty-nine animals, in 38 per cent typical lesions occupied the previously untouched scarified area in from two to six weeks. Their conclusion is that when introduced into the blood, *Trichophyton* remains in circulation about twenty-four hours. If the capillaries of the normal skin are intact, no spores lodge in this tissue, but where capillary walls are damaged, the spores leave the circulation and are deposited in the epidermis, where they multiply and set up a dermatomycosis.

"Monilia albicans" has been proved to cause septicemia. Wachowiak and Fleisher have cultivated *Monilia psilosis* from the blood in sprue, and I have done the same, and the dangerous *Mycoderma* (or *Blasto-*

mycoides) *immite, dermatitis* and *brasiliense* are disseminated by the blood stream, as is also *Rhinocladium.*

It would be impossible to select even a few dermatophytes for individual attention. The list is truly long, but it must be borne in mind that not all of those so well described for temperate climates are found in the tropics. Not only this, but *Trichophyton* infections of the hair apparently are not common in all tropical lands. In Porto Rico they are relatively uncommon, and Magalhães, a well known medical mycologist in Rio Janeiro, reported that they are rare in Brazil. On the other hand, the dermatophytes of animal origin, for the most part included among the *Sabouraudites,* are not uncommon. Favus has not been found, to my knowledge, in Porto Rico, and Magalhães reported only 4 cases of 160 mycoses. The epidermomycoses, however, are extremely prevalent in the tropics, and when research has thoroughly invaded this field of mycology, the varieties will include some genera hitherto considered saprophytic only.

Among the common causes of tinea seen in Porto Rico is *Sabouraudites rubra* (*Epidermophyton rubrum* Castellani), but it is not confined to the inguinal region and is a nomad. *Epidermophyton cruris* Castellani is also frequently seen.

Tinea imbricata seems not to be a disease of tropical America. No *Endodermophyton* has yet been found in Porto Rico.

In the broader field of the dermatomycoses, exclusive of dermal blastomycoses already covered, is an extremely common form of tropical pityriasis known as tinea flava, said to be due to *Malassezia tropica* Castellani, 1905, but the fungus has not yet been cultivated. Tinea nigra due to *Cladosporium mansoni* has been reported from Porto Rico.

Pinta seems to be essentially a disease of tropical America. It consists of curious, smooth, pigmented areas, white, black, yellow, violet or blue, affecting the face prominently. The mycologic studies of these lesions is a mass of confusion, due to attributing a pathogenic quality to a large number of what appear to be saprophytic contaminants and to lack of experimental evidence. Here is a rich field for research. Arjona distinguished between pinta, a disease not due to fungi, and caraté, which causes itching and desquamation, and which is probably mycotic. Most authors consider pinta and caraté synonymous. Castellani was unable to demonstrate any pathogen in pinta in Honduras. Of late I have been isolating *Pullularia pullulans* in violet pinta, but as yet I have no experimental evidence to prove its pathogenicity. The common dermatitis verrucosa of Brazil reported by Pedroso has been found by both Ota and Langeron to be *Trichosporon.* The nodular disease of hair, piedra, found in Colombia, is due to *Trichosporon giganteum* Behrend, 1890, and now Ota has made the genus less of a curiosity by reporting that *Mycoderma cutaneum, Parendomyces*

asteroides, Parendomyces balzeri and *Hemispora rugosa* should fall in this genus, which is almost certain to become an important one in tropical mycology.

Acladiosis of the skin has been so named by Castellani for a multiple sporotrichosis-like lesion. The ulcers are round or oval and sharply defined, and have a red, granulating surface which is often crusted. There is a nocturnal fever and enlargement of superficial glands. The condition is due to *Acladium castellani* Pinoy, 1916, but, so far as is known, it is not found in the American tropics.

Sporotrichosis.—While *Sporotrichum* is not a dermatophyte, and in spite of the fact that sporotrichosis is essentially a generalized mycosis, the fungus is being found more and more in the most varied skin lesions, and will be considered here. Sporotrichosis is a disease which previous to the revelation of its mycotic nature in 1896 by Schenk, an American, had been confused with syphilids and tuberculids. It is caused by a number of species of the genus *Rhinocladium* (order *Conidiosporales*), the genus *Sporotrichum* containing only hyalosporous organisms. These spores are sessile. The only pathogen of this group which is a true *Sporotrichum* is *S. carougeaui* Langeron, 1913.

Sporotrichosis is not uncommon in some parts of the tropics. Magalhães found 31 in 160 cases of mycoses in Brazil. I found one case of the localized variety in Porto Rico due to *Rhinocladium gougeroti.* In reality, sporotrichosis is not as common in practice as its importance in the literature might seem to indicate.

The organism at times adopts a yeast form in the tissues and in culture, but in the latter they eventually become filamentous. They may run from 1 to 15 microns in diameter.

De Beurmann and Gougerot have found *Rhinocladium* in a saprophytic state in nature, which they elevated to the state of a pathogen by passage. Probably some such evolution takes place frequently in human beings in contact with contaminated vegetable growth and animals. Such persons may act as carriers and by passage to others by direct contagion may eventually produce the adaptation necessary to the organism to parasite man. Horses, dogs and rats are the principal sources of contagion. Abrasions or scratches greatly favor infection. Grütz stated that when the organism is disseminated by the blood it causes generalized infection with invasion of any organ; when spread by the lymphatic system, it is localized in a segment of that system. He also stated that there is a form, probably due to contaminated food, that is localized in the mouth and anus and surrounding parts. In the localized form the primary lesion, the homologue of syphilis, an indolent ulcer, usually taken for a tuberculid, slowly develops throughout months, and the infection ascends a definite lymphatic track with small gummas at more or less regular intervals. This gumma, which is the most

frequent lesion, is a slow-growing, hard, elastic, painless mass, rather movable under the skin. Gradually it grows in size and takes on a dusky red or violet hue. Later, the skin becomes adherent and ulcerates, exposing a red, easily bleeding floor. It is difficult to recognize a sporotrichosic nodule from the histologic picture alone. Adenopathies are rare. These nodules become filled with a white, semitransparent, thick pus previous to ulceration through the skin.

In generalized sporotrichosis, there is usually no recollection of the primary lesion. There are gummas, visceral sporotrichosis (especially testicular), arthropathies and osseous involvement. In this case the gummas appear without reference to any special lymphatic segment. They are especially frequent on the trunk, arms, forearms and thighs, but are not common on the face and hands.

In making the diagnosis de Beurmann and Gougerot laid great stress on the character of the gumma, the polymorphism of the lesion and the absence of constitutional signs. Cachexia appears late, often with involvement of the bone and, especially, of the testicle or eye. When the nasal mucous membrane is attacked, the condition closely simulates syphilis and, were it not for a much slower growth, leishmaniosis.

Grütz states that the localized lymphatic spread of the disease may be converted into the generalized form by contamination of the blood through the chylous duct or by the erosion of a vessel in the vicinity of an infected lymph channel. Vice versa, a generalized blood infection can occasion a localized form by infection of the lymph vessels that drain a gumma.

The more recent developments concerning sporotrichosis have to do with its localization in the skin. These infections of the superficial layers of the skin may counterfeit a most varied collection of clinical forms: papules, pustules, warty lesions, acneform lesions, pemphigus, erythema induratum, lupus vulgaris, impetigo, seborrhea, etc. There are even lichen sporotrichosis and follicular and eczematoid lesions. A case of sporotrichosic cachexia mentioned in Grütz' treatise gave a blood picture suggestive of pernicious anemia.

The disease is not to be feared when treatment with large and long-continued doses of potassium iodide is given in time. The advance of sporotrichosis is slow, and there is plenty of time for the physician to make an easy diagnosis if he only suspects that this condition is present. When, however, cachexia and serious visceral lesions, especially of the eye, mucous membrane and testicle, appear, the prognosis is bad. Sporotrichosic lymphangitis is obstinate in treatment.

No immunity is conferred by sporotrichosis. In fact, any mycosis sensitizes to infection by a sort of anaphylaxis. One of the reasons for believing that *Bacillus tuberculosis* is a fungus is that tuberculous persons are especially prone to sporotrichosis, and the two infections react unfavorably on each other.

The technic for diagnosis is a special one. The organisms should not be looked for in the pus, as they are too few and the obstacles to their delimitation are too great. A good quantity of pus, not less than a mil, should be allowed to trickle down the surface of a Sabouraud dextrose agar slant. When the material has been obtained from biopsy (a verrucose lesion, for example), grind it up in a sterile mortar and sow the emulsion as already indicated. At least three tubes should be sown, and the cotton stoppers should be left out. In from five to twelve days the colonies develop, at first white, later brown. One of the best methods of making a rapid diagnosis is by the examination of poured plate cultures under the high dry lens.

The rat is the best experimental animal, particularly the white rat. Strangely enough, rabbits inoculated by the marginal vein of the ear often develop only skin lesions (Grütz). The serologic diagnosis is fallacious if any other fungus has become parasitic. Langeron stated that the mere presence of a yeast or *Monilia* is sufficient to give a positive reaction, and the same applies to intradermal tests.

THE MYCETOMA

The mycetoma is a tumor of inflammatory tissue caused by a variety of fungi. It contains here and there grains formed of a compact mass of mycelium, which are eliminated through fistulous tracts opening on the skin. While they can form anywhere in the body, they are usually found in the foot, as this is most frequently exposed to traumatism by thorns, splinters and other perforating bodies carrying the infective agent. Popularly, the term is applied to those lesions in the foot that cause it to swell enormously and change the hollow arch into a convex surface with spreading of the toes. The tumor is hard and elastic in places; in others, soft. There is destruction of the normal tissues, tendons and their sheaths, muscles, and, in many cases, bone.

Chalmers and Archibald classified the mycetomas in two groups: the actinomycoses, produced by *Microsiphonata* or organisms the branching hyphae of which have a diameter of less than 1 micron, have neither nuclei nor septums, and frequently break up into bacilloid or coccoid elements; and the maduromycoses, which are due to a variety of higher fungi the mycelium of which is over 1 micron thick, are septate and generally provided with spores.

It is difficult, however, to limit the term, actinomycoses, to the gumma, chiefly of the foot, and to use another, oosporosis, when the same organism is diffuse in the lung, where is produced the type of lesion by which "actinomycosis" has been popularized in medical works. To speak of mycetomas due to *Actinomyces*, to *Cohnistreptothrix*, to

Madurella, to *Sterigmatocystis,* etc., in each case naming the genus for precision's sake, seems clearer and simpler than to use such artificial nomenclature.

MYCETOMAS DUE TO ACTINOMYCES

The actinomyces found in mycetomas, probable cause of the original "Madura foot" described by Gill in India, take Gram's stain and may even be acid-resistant. Their only mode of reproduction is by arthrospores. The actinomycoses are best divided into the black-grained, yellow-grained and red-grained varieties. The first variety is rare and due to unstudied species. The yellow-grained species are the best known. Of the latter there are two groups, in one of which the grains are surrounded by rays of club-shaped elements, and in another of which no rays are found. The first of these contains *A. israeli* and *A. bovis,* indistinguishable save in culture, as well as a few others. The most common pathogen of the second group is *A. asteroides.* Worthy of mention also is *A. somaliensis* Brumpt, 1906, found twenty-eight times in Brazil by Yasbek. This organism causes the so-called white-grained mycetoma of Bouffard. The grains are about 1 mm. in diameter, are really reddish yellow, and look like fish roe. They are very hard and cannot be dissolved by potassium hydrate.

The red-grained, or ochroid, variety is one of the oldest known and was one of the first to be described in India under the name of Madura foot. One of the outstanding species is *A. indicus* Kanthack, 1893. *A. madurae* Vincent, 1894, is another species, the first pathogenic *Actinomyces* to be cultivated from a mycetoma. It does not invade bone, whereas *A. bovis, A. israeli* and *A. somaliensis* cause a more or less complete destruction of this tissue. The grains are ochroid and can reach the size of a pea. In section of tissue the grains are surrounded by a characteristic crown of amorphous rays which are not parasitic. Chalmers and Christopherson expressed the belief that these two species are synonymous.

Mycetomas Due to Higher Fungi (Maduromycoses) Black-Grained Mycetomas.—Black-grained mycetomas were found by Vandyke Carter in 1860 to be due to fungi, but they were not cultivated, nor was their classification begun until 1917. They can be caused by a variety of genera:

Glenospora (the Soudan and India)
Aspergillus (Somaliland)
Madurella (Somaliland, Tunis, Senegal, Brazil)
Scedosporium (Italy, Algiers, Brazil)
Penicillium
Torula (of Persoon-Saccardo)

They are found most frequently in dry, hot regions, such as the desert.

White or Yellow-Grained Maduromycoses.—This type is fewer in number:

Indiella so far not cultivated (Far East)
Scedosporium (apiospermum) (Algiers, Morocco, Brazil)
Sterigmatocystis (Tunis)
Allescheria (Mexico)

Red-Grained Maduromycosis.—This condition is probably due to *Aspergillus.*

Histologic Anatomy.—According to Montpellier and Catanei, the mycetoma has three periods of development:

1. The mycetomic nodule, a well limited tumor with many secondary ones, each containing a grain surrounded by a zone of leukocytes, and this in turn by a zone of macrophages with evidences of small capillary hemorrhages. No giant cells are seen.
2. The period of the mycetoma with fusion of many such nodules and the opening of fistulas on the surface.
3. The period of Madura foot with a lardaceous tissue, disintegration of bone and fistulas.

Development is very slow. Little by little, the foot or other part swells, with increasing pain and discomfort. When fistulas form, the pus which exudes is apt to be oily and of a fetid odor. The skin of the member is covered with nodosities, and after amputation, practically all normal tissue, often including bone, is found to have been destroyed. If abandoned to its course, a mycetoma causes death by cachexia.

The mycetomas undoubtedly originate from saprophytic species. Lignières reported the identity of certain saprophytes he found in soil and vegetation with *A. bovis.* In South Africa, Pijper and Pullinger reported that the rolling prairies are reservoirs for *Actinomyces,* and that these are disseminated by winds. Despite this ample statement, they had seen only eleven cases of mycetoma in ten years. All were actinomycoses, none maduromycoses. It is easy to see why the mouth parts (jaw), infected by chewing twigs and blades of grass, and the feet, exposed to thorns and splinters, are generally the parts affected.

Gammel stated that so far there have been in the United States but twenty-one cases of mycetoma due to *Actinomyces* and ten of maduromycoses, including his four cases, two of which were due to new species, *Madurella americana* and *M. ikedai.*

It is reported that since 1899 there have been but sixty human cases in Uruguay; an average of 1 to 536 head of cattle were found to be

actinomycosic in a carefully inspected abattoir. The species were generally *A. bovis* or *A. asteroides.*

Tunis seems to have registered but sixteen cases to 1924.

While the disease is more prevalent than it seems to be, it cannot be said to be common anywhere, and it is rare in the United States.

Paramycetomas are merely mycotic invasions without the formation of visible grains. Chalmers and Archibald lay great stress on the presence of Russell's bodies in these lesions and on evidences of capillary hemorrhage (pigment) in connection with mycelial elements and microscopic grains in tissues.

Langeron considered dermatitis verrucosa or chromoblastomycosis, reported from Brazil by Pedroso and due to *Trichosporon,* to be a real paramycetoma. In this classification, he also includes Magalhães' hyphomycetoma.

Unfortunately, the treatment is amputation, unless, if recognized early, it is possible to do a complete ablation, including surrounding apparently healthy tissue and adjacent glands, as in cancer.

DISEASES DUE TO MICROSIPHONATA OTHER THAN THOSE PRODUCING MYCETOMAS

Foulerton's classification of *Microsiphonata* elaborated by Chalmers and Christopherson is the best key to an understanding of a bewildering number of species. He grouped them on a parallel into parasitica and saprophytica. These groups are divided into (1) *majores,* which are easy to cultivate, produce a white, chalky growth on solid mediums and have branched filaments which are not acid-resistant; (2) *minores,* which are also rather easy to cultivate, produce colonies similar to those of *Bacillus tuberculosis,* are almost always acid-resistant, and are rarely branched; (3) *breviores,* which are difficult to cultivate and yield short bacilloid forms which are not branched. The *minores* are the most pathogenic. The subgenus *Cohnistreptothrix* embraces species that are difficult to cultivate, are preferably anaerobes and do not produce arthrospores. According to Pinoy, *Cohnistreptothrix israeli* is found to be a more common source of actinomycosis than *Actinomyces bovis.*

The extremely interesting relation between Foulerton's saprophytic and parasitic groups is at present a much discussed question in mycology. Lignières, who studied *Actinomyces* in South America, avers identity between *Actinomyces bovis* and certain common saprophytic strains which he obtained from the earth, manure, dust, grain, straw and even the excrement and organs of animals that were not suffering from actinomycosis. As *Actinomycosis bovis* cannot be successfully inoculated into animals nothing can be proved.

Col. Edward Vedder of the Medical Corps of the Army, in a recent series of lectures given at the invitation of the School of Tropical Medicine of Porto Rico, called attention, in connection with leprosy, to the affiliation of *Bacillus leprae* and *Bacillus tuberculosis* with *Microsiphonata,* to the low aggressivity of the former and lack of proof of contagiousness and to the possibility of invasion of the human organism by this bacillus from the soil, where it might need to pass a saprophytic cycle before attacking a fresh human host. It seems evident that the reservoir of *Actinomyces* is the soil and gramineous plants. Foulerton called attention to the fact that herbivorous animals are most likely to become hosts of *Actinomyces,* and stated that *Actinomyces* recovered from gramineous plants are more likely to be acid-resistant.

Langeron employed the term oosporoses for lesions produced by *Actinomyces* which are neither mycetomas nor tuberculosis, but some of his oosporoses show microscopic grains. As far as the tubercle is concerned, the term becomes even more confusing. He himself acknowledged the histopathologic identity of certain oosporoses and tuberculoses. The organism, if acid-resistant, is often morphologically indistinguishable from *Bacillus tuberculosis.* Clinically, the two diseases are of extremely close allure, and the x-rays do not help in differential diagnosis. In case of doubt, only cultural and mycologic study will distinguish them.

There seems to be a link in the chain, the *minores* group of *Microsiphonata parasitica,* which connects up with *Bacillus tuberculosis* and *Bacillus leprae.* The clever idea of Edith Claypole (cited by Langeron) that *Bacillus tuberculosis* and *Actinomyces,* while not identical, originally came from some common strain, is probably correct.

One can fairly deduce that some actinomycotic invasions not producing visible grains can so well counterfeit pulmonary tuberculosis as to elude the vigilance of physicians who depend only on the diagnostic facts heretofore considered infallible: the clinical picture, acid-fast organisms in the sputum and roentgen observations. The deduction which ordinary common sense dictates from all of this is that only a few doubtful cases probably exist. It would be dangerous to treat such patients with large doses of the iodides, a veritable specific in some of these cases, without having found abundant branching filaments in culture, as medication of this kind is strongly contraindicated in tuberculosis.

Other sites besides the lung are the eyes, lacrimal ducts, mouth, kidneys and skin (*Actinomyces minutissima,* the agent of erythrasma). The trichonocardiases, or nodular diseases of the hair, are caused by *Actinomyces tenuis* Castellani, 1911, and are tropical diseases for the most part. There are also oosporoses producing suppuration, subcutaneous or visceral, as well as a group producing cerebral abscess.

Of the many species so far described, *Actinomyces asteroides* is distinguished, not only by its frequency and its virulence, but by its cosmopolitan character. Unhappily, the iodides are futile in treatment for lesions due to this organism.

DISEASES PRODUCED BY OTHER FUNGI

The Phycomycetes.—The evidence of the pathogenicity of species in genera of this class is usually flimsy. There has been one case of apparent septicemia due to *Lichtheimia corymbifera* and one case of pneumonia. *Rhizopus* has been also incriminated in a few otomycoses.

The Ascomycetes.—Genus *Aspergillus:* There are a large number of species said to produce mycoses, but in many cases the data will not bear close scrutiny. *Aspergillus fumigatus* apparently has caused a few fatal cases of mycosis of the lung. Various species have a reputation for causing otomycosis, and undoubtedly organisms of this genus at times can provoke the lesions, but no experimental data back most of the asseverations as to pathogenicity. It will be remembered that an *Aspergillus* was found to produce a mycetoma.

A bona fide case of miliary dermo-epidermititis pustulosa was reported by Ota as due to *Aspergillus jeanselmei* Ota.

Genus *Penicillium:* Only four cases of mycoses of the lung had been reported, according to Talice and MacKinnon, previous to their report in 1929 of a fifth case due to *Penicillium bertai.* This genus is also credited with producing otomycoses.

Genus *Sterigmatocystis:* Aside from the mycetoma caused by *Sterigmatocystis nidulans,* there are many reports to indicate that it can cause otomycoses.

Genus *Scopulariopsis:* Much of the attention which this organism has received in medical mycology comes from its undoubted connection with onychomycoses. Bearing in mind Weideman's belief that the toe-nails are often foci of infection from which epidermomycosis can proceed, I can chronicle a case of infection by an undescribed species of *Scopulariopsis,* which extended from the toe-nails over the entire lower part of the abdomen, buttocks and thighs of a well-to-do woman who after a year's suffering came to me complaining of the intolerable itching and burning which had produced a nervous breakdown. The organism was sent to Langeron, who confirmed it as *Scopulariopsis.* It has not yet been tried out in experimental animals, and I therefore consider the investigation incomplete.

There are a number of genera not mentioned which have caused or are supposed to have caused mycoses, but the object of this paper has been to discuss only the important pathogens and to demonstrate the need for a closer study of mycology in tropical medicine.

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THE GROWTH OF HAIR IN NEWLY BORN ALBINO RATS*

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The present study was undertaken to shed additional light on the somewhat obscure subject of growth of hair. Our test animal was the albino rat, *Mus norvegicus-albinus*.

The albino rat is born blind and hairless. The eyes open from the fourteenth to the seventeenth day of life, which is about the period of maximum growth of the hair. According to Donaldson,[1] the span of life in man is thirty times that of the albino rat. The span of life for the rat is three years; this would be the equivalent of ninety years for man. Figure 1 shows the hairless condition of the rat at birth contrasted with its full growth of hair at the eighteenth day. As far as we have been able to ascertain, this appears to be the most rapid growth of hair in animal life.

During the period of a year we studied the microscopic changes that take place in the rat from the first to the sixteenth day of life. The accompanying photomicrographs give evidence of the startling rapidity of growth of hair and of the multiplication of follicles from day to day.

Knowledge of the growth of hair and the changes that take place in the follicles is meager. Much less is known about the factors that control and influence the production of hair. Several of our workers are engaged in work along these lines, and we hope to be able some day to announce something more definite. There is no doubt that the endocrine glands play a great part in the growth of hair, but how and at what stage is difficult to prove. It is exceedingly difficult to obtain satisfactory material for testing the influence of the endocrine glands on the growth of hair. To do this, one should have animals for observation in the embryonic stage or before the majority of the follicles are formed.

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MATERIAL AND METHOD OF STUDY

Pregnant rats were secured and kept in the laboratories. After the young rats were born, one was killed each day for twelve consecutive days. A piece of skin was removed from the dead rat, fixed in formaldehyde and sectioned. Some of the sections were stained with hematoxylin and eosin and some with trinitrophenol (picric acid). We cut the sections serially, both vertically and horizontally. The same procedure was repeated four times with the same breed of rats, which was necessary in order to permit us to draw more definite conclusions. We chose the same breed because the growth of hair varies in animals just as it does in human beings. Sections from different breeds of rats were compared with the type on

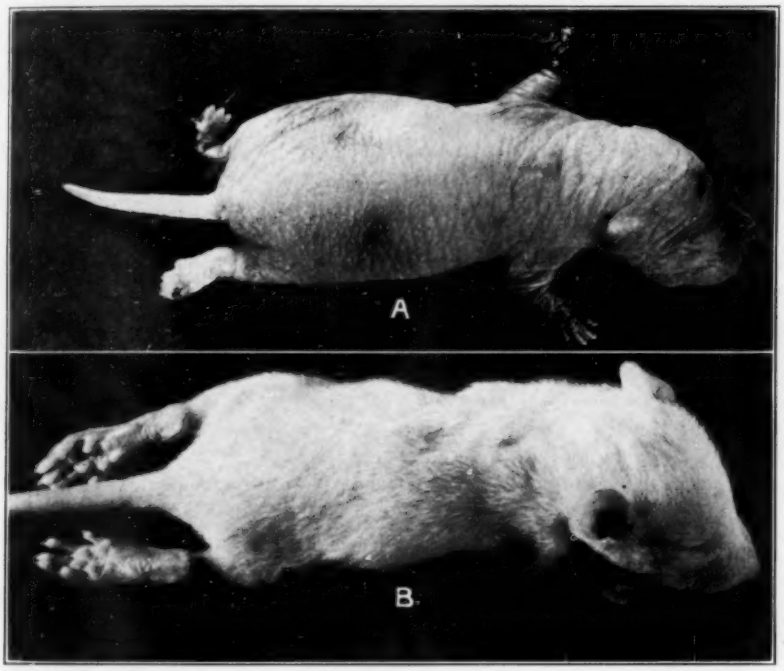

Fig. 1.—*A*, a 1 day old, hairless rat; *B*, an 18 day old rat, showing maximum growth of hair.

which we experimented; in some cases there were more follicles and in others slightly less. The comparison was made with sections taken from rats of the same age.

We removed the testicles and in some cases one of the adrenal glands in 1 day old white rats, and observed a demonstrable stunting influence on the growth of hair. Whether this repression of growth was exclusively the result of the action of the endocrine glands or whether it was due to an adverse effect on the general growth of the animal we cannot positively assert, but we strongly suspect the former.

A great, practical obstacle, however, interfered with our experiments. The mother, in most instances, would devour the young if they had been operated on. We have tried in various ways to prevent the destructive depredations of the mother, but thus far we have not succeeded.

RESULTS

The paraffin cut sections were studied microscopically and were compared with each other. The number of follicles in the 1 day old rats averaged from two to four per fold (fig. 2). They were small in diameter, and there was no evidence of cornification. Most of these follicles were lodged just beneath the epidermis, and in some instances the break from the inner layer of the skin was not complete. The linear arrangement of these follicles beneath the epidermis and the similarity in their diameter indicated their recent development. The cells of the follicles were deeply stained and consisted of from one to two layers. The matrix was made of loosely arranged connective tissue cells with few blood and lymphatic vessels. The epidermis con-

Fig. 2.—Photomicrograph of a section of skin of a 1 day old rat, showing from two to four hair follicles per fold. *A* indicates a follicle.

sisted of several epithelial layers that showed slight cornification on the outer surface. From the basal epithelial layer we noted several small evaginations or piling up of cells that projected into the underlying tissue (*A*, fig. 2). These budding processes were more numerous in sections of the 2 and 3 day old rats, respectively (fig. 3 and *A*, fig. 4).

In the sections taken from the 2 day old rats the number of follicles per fold was approximately double that in sections from the 1 day old rats. Besides this numerical increase, we noticed that the follicles extended deeper into the underlying tissue and were not so regularly arranged (fig. 3). The diameter of the individual follicles was greater, and few of them showed cornification in the center which indicates the formation of the shaft. The budding processes were more conspicuous.

The sections from the 3 day old rats showed further numerical increase of the follicles (fig. 4). The number varied from 10 to 15 follicles per fold. The downward extension and the irregularity in

Fig. 3.—A section of the skin of a 2 day old rat, showing from about four to eight hair follicles per fold. *A* shows how much deeper the follicles are extending into the underlying tissue.

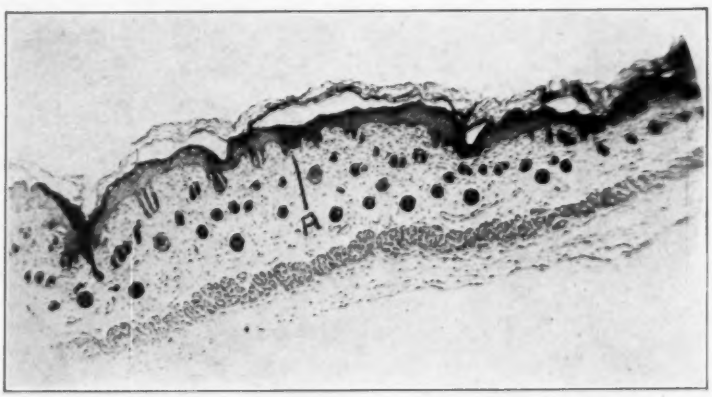

Fig. 4.—A section of the skin of a 3 day old rat, showing from ten to fifteen hair follicles per fold.

distribution were more marked. Cornification was present in more follicles, and in some of them it was denser.

Between the third and fourth day after birth, there was a tremendous increase in the number of follicles, and most of them were well developed. Also cornification of the hair shaft was evident, and, in a

Fig. 5.—A section of the skin of a 4 day old rat.

Fig. 6.—A section of the skin of a 5 day old rat.

number of them, it made its appearance beyond the epidermis. Some hairs were completely developed at this time, and the follicles differentiated into cortex, medulla, hair papilla and hair bulb (fig. 5).

After the fifth day, the number of hairs was so great that we could not notice any appreciable increase in the number, though the individual hairs looked thicker and denser and gave the appearance of being more mature. The shafts gradually increased in number with the growth of the animals. Sections were made each day until the twelfth.

A daily notation was also made of the gross growth of the hair. The appearance of hair visible to the naked eye was first observed at the end of the seventh day. This became more marked gradually, until it became distinctly visible on the sixteenth day after birth (fig. 1, *B*).

CONCLUSIONS

1. New-born albino rats that are hairless at birth develop a full coat of hair within sixteen days.

2. Our study indicates a remarkably rapid development of new hair follicles in the skin almost from day to day. The greatest increase of follicles is observed from the third to the fourth day of life.

3. We have suggestive evidence that the removal of the testicles or of one adrenal gland on the first day of life tends to stunt the growth of hair.

EPIDERMOPHYTOSIS OF THE FEET AND EPIDERMOPHYTIDS OF THE HANDS

CLINICAL, HISTOLOGIC, CULTURAL AND EXPERIMENTAL STUDIES *

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There is no question in the minds of most dermatologists today that the hyphomycetes isolated from the dyshidrotic, intertriginous or vesiculopustular diseases of the feet are the etiologic agents. However, dermatologists are as yet not agreed about the pathogenesis of the dyshidrotic or squamous eruptions on the hands which are often seen at the same time, especially since many authors, such as Schramek,[1] Bloch,[2] von Graffenried,[3] Walthard,[4] Williams,[5] Alexander,[6] Rajka,[7] Keller,[8] Miescher [9] and Jadassohn and Peck,[10] have pointed out that the fungi are but seldom isolated from the lesions on the hands, while they are easily demonstrated in those on the feet.

Among the fifty cases reported from the Zurich clinic (two by von Graffenried,[3] one by Walthard,[4] twenty-four by Jadassohn and Peck [10] and twenty-three new cases reported here) there were forty-eight in which the fungi were demonstrated easily and in great numbers, microscopically and culturally, in the lesions on the feet, while in the same patients the accompanying dyshidrotic and squamous lesions on the hands were negative for fungi. Only two cases, one reported by von Graffenried [3] and the other in the present series, were observed in which they were demonstrated in both the hands and the feet.

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The fact established by these observations is remarkable and calls for further explanation. There are several possibilities which have already been discussed by Bloch [2] and Walthard.[4]

First, it should be made clear that the objections raised by Sabouraud to the observations made by my associates and myself (Swiss Dermatological Congress, Geneva, 1929) are not warranted. Sabouraud attributed the negative observations for fungi from the lesions on the hands to technical difficulties. He suggested that fungi were also present on the hands, but for some unknown reason they were more difficult to cultivate from the hands and therefore were not demonstrated. His objections to the negative observations could perhaps be valid if one were dealing with isolated, rare cases which perhaps had not been examined enough. His explanation, however, becomes highly improbable when one considers the large series of cases (forty-eight) in which the same results were obtained: fungi easily demonstrated in large numbers, at the first attempt, microscopically and culturally, in the lesions on the feet, and in spite of the same technic and repeated investigations, never demonstrated in the lesions on the hands. It is obvious that another explanation must be sought.

As Bloch [2] and Walthard [4] pointed out, there are three possibilities which would explain these observations:

1. The fungi found on the feet were just chance saprophytes and played no etiologic-pathogenic rôle. As has been mentioned, this is unlikely from what is known about the pathogenesis, clinical manifestations and therapy of these dermatoses and from the experimental mycosis produced by von Graffenried [3] and myself with the isolated fungi—in my experiments, in every way resembling the clinical cases.

2. The epidermophytosis on the feet was, by chance, combined with a disease on the hands which was etiologically and pathogenically different —not mycotic but dyshidrotic (?) or eczematoid. That such a chance combination may be true for a few cases is not to be denied, since on the hands have been seen dyshidrotic and eczematoid eruptions which closely resembled the manifestations described here and which had nothing to do with fungi, the true dyshidrosis of Tilbury Fox (?), eczema and perhaps coccus infections. However, not only is this explanation unlikely for all of the cases reported here, in view of the large series studied and the frequency of the observations; but direct proofs will be given in what is to follow to show that it is wrong. A logical consideration alone would lead to the conclusion that it cannot be pure chance which has made it almost a rule to find mycotic conditions of the feet combined with sterile lesions of the hands in the same person; that, on the contrary, there is a direct relationship between the

two. Such a relationship which would satisfactorily explain my observations in all particulars would be included in the next conception.

3. The lesions on the feet are primary mycoses (epidermophytoses), while the lesions on the hands are secondary mycids (epidermophytids).

In an effort to clear up this question, Williams [5] suggested that the dyshidrotic changes on the hands which accompany so many of the cases of foot mycosis were toxic eruptions, the source of the toxin being a deep tinea on the feet. At about the same time, Bloch [2] conceived the idea that they were probably epidermophytids, bearing the same relation to the mycotic infections on the feet that a lichen trichophyticus does to a kerion celsi. From these points of view, the negative observations for fungi on the hands would fit in with what is known of other "id" eruptions, such as tuberculids and trichophytids.

If this explanation is the correct one, the changes on the hands are secondary to the hematogenous transport of spores, mycelia or toxins (?) from the primary foci on the feet and their localization on the hands.

Von Graffenried [3] was the first to point out that in spite of the apparent superficiality of the foot infections, an allergic state was produced—the trichophytin reaction was positive. This was usually seen only in the deeper forms of dermatomycotic infections, such as kerion celsi. With this fact, if it holds true for the majority of foot mycoses, one has a conditio sine qua non for an "id" eruption established. According to the definition of Bloch, trichophytid (epidermophytid) is the name given to the mycotic eruption which—in analogy to the tuberculid—comes into being when a fungous element (or toxin?) is hematogenously transported from a primary deep trichophyton (epidermophyton) infection to the allergic skin.

The conception of the changes on the hands as epidermophytids was further supported by Walthard [4] of this clinic, who reported the first case in which the relationship between the lesions on the hands and those on the feet was clearly indicated.

A girl, aged 13, had an intertriginous vesiculopustular mycosis of the feet and at the same time a vesicular exanthem on the hands, arm and face; on the hands, it had the typical picture of a dyshidrosis. The eruptions on the hands appeared after the condition of the feet had been present for some time. The lesions on the feet were microscopically and culturally positive for fungi (*Epidermophyton* Kaufmann-Wolf, while the lesions on the hands, arms and face were microscopically and culturally negative. The trichophytin reaction was strongly positive. After the injection of trichophytin there was a herd reaction and the appearance of new vesicles on the hands and feet, which were also negative for fungi.

Jadassohn and Peck [10] then made a detailed study of twenty-four cases of mycotic infections of the feet which were associated with

dyshidrotic or scaling manifestations on the hands. The following data obtained from their studies still further support the interpretation of the eruptions on the hand as epidermophytids:

1. The lesions on the hands (in those cases in which the patient knew of his foot mycosis) appeared after the foot infection had been present for some time; and in some of the cases, typical eruptions appeared on the hands after mechanical or chemical trauma of the lesions of the feet (treatment) or after a trichophytin reaction.[4]

2. In each of the cases there was a positive trichophytin reaction, demonstrating a state of allergy.

3. In analogy to the other "id" eruptions, the lesions on the hands were microscopically and culturally negative for fungi, while the primary lesions of the feet in every case were microscopically positive for fungi; and in seventeen of the cases the same fungus, *Epidermophyton* Kaufmann-Wolf, was cultivated.

4. Generally, the lesions on the hands healed only when the primary focus on the feet was treated.

5. In one case, the dyshidrotic changes on the hands were accompanied by a generalized epidermophytid of the same character.

It is fair to conclude from these results that there is a relationship between the manifestations on the hands and those on the feet, and that it is likely that the involvements of the hands are epidermophytids secondary to the primary lesions on the feet.

The occasional finding of fungi in lesions on the hands—as in one case of Alexander's[6] and one of von Graffenried's[3] and one of my own, to be reported here—rather speaks for the conception of the lesions on the hands as epidermophytids. In my understanding of their pathogenesis, the fungus elements reach the hands hematogenously, and the clinical picture resulting is a reaction between them and the allergic skin. It is therefore obvious that if the lesions on the hands are examined early enough, it may be possible now and again for fungi to be demonstrated—just as has been the case in trichophytids. A number of important proofs, such as positive blood cultures for fungi and the experimental reproduction of the entire disease syndrome in man, were still lacking to substantiate this point of view, and it was for this reason that this work was attempted.

This paper reports on (1) the clinical investigations of twenty-three new cases of foot mycosis combined with pathologic changes on the hands, (2) histologic examination of the primary lesions on the feet and of the epidermophytids on the hands, (3) cultural and microscopic studies of the fungi isolated, (4) a positive blood culture for fungi and (5) the experimental reproduction of the disease syndrome in man —epidermophytosis and epidermophytid.

CLINICAL INVESTIGATIONS

In the accompanying table are given the analyses of twenty-three cases of mycosis of the feet in which there were at the same time pathologic changes on the hands. The plan of the table is identical with that of the twenty-four cases studied by Jadassohn and myself;[10] it is for this reason that the first case in this new series has been numbered 25.

Lesions on the Feet.—There were two types of lesions; often both occurred in the same patient (fig. 1*A*).

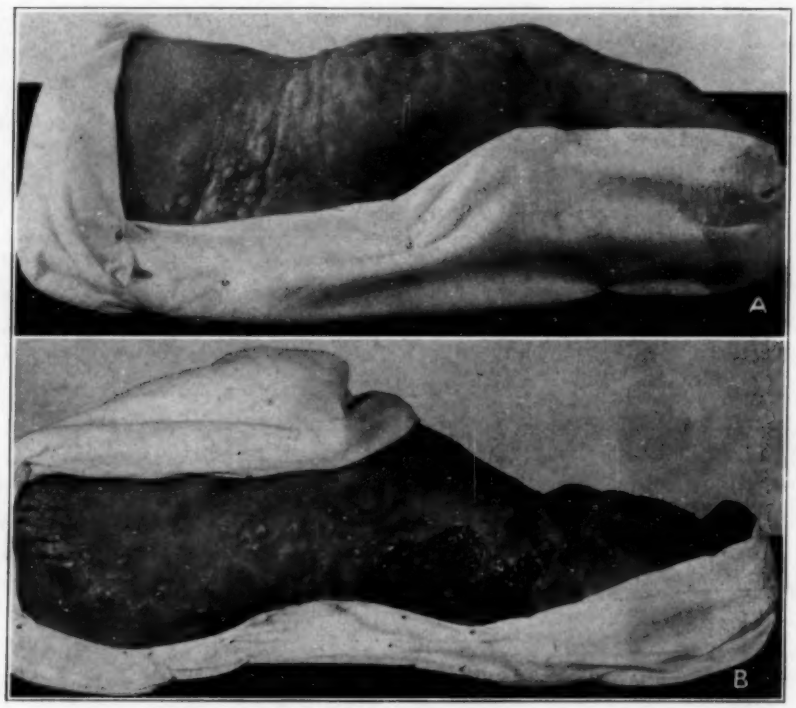

Fig. 1 (case 36).—(*A*) Dyshidrotic epidermophytid. Lesions negative for fungi, microscopically and culturally. A positive culture of Epidermophyton Kaufmann-Wolf was obtained from the circulating blood of this patient. (*B*) Intertriginous vesiculopustular mycosis (epidermophytosis). Fungi easily demonstrated microscopically and culturally (Epidermophyton Kaufmann-Wolf).

The first was the intertriginous type described by Sabouraud, which was found between the toes with a predilection for the fourth interspace, as has so often been pointed out. A prominent subjective symptom was itching. The skin of the affected interdigital fold was reddened, thin and often marked by fissure formation and oozing. There was often a great deal of attendant maceration. The edges of

the lesions were usually sharply circumscribed and micropolycyclic and showed coarse scales. Small vesicles and pustules were often found along the border of or in the lesion itself. The process was sometimes confined to one interdigital space, or it extended along the sides of the toes, involved several interdigital spaces on one or both feet and even spread to the sole or the dorsum of the foot.

In the cases in which the patient was unaware of an involvement of the foot, the process was either limited to one interdigital space and showed a remarkably small area of pathologic change for the degree of involvement of the hand, or it was represented by a scaling, usually between the toes, with little inflammatory reaction and no pain or itching.

It is probable that type 1 is essentially not different from type 2, but that it also is primarily a vesicular dermatitis which because of its special localization in the folds between the toes macerates quickly and becomes intertriginous.

The second type was that which Sicoli [11] called mycosis dyshidrotica. It is better named vesiculopustular epidermophytosis, to distinguish it from the dyshidrotic epidermophytids on the hands because of the predominance of the pustular elements in the former. The main element in this type was a small vesicle with a surrounding zone of erythema which quickly became filled with pus. These pustules varied from the size of a pinhead to several centimeters in diameter; through confluence, especially along the edge of the foot, pus-filled vesicular lesions were formed which sometimes reached the length of 6 cm. It was characteristic of the lesions on the feet that the pustules and vesicles showed a tendency to grouping and the formation of circular and polycyclic patches as a sign of parasitic origin.

Through spontaneous rupture, drying and confluence of vesicles, there developed irregularly round areas of different size, usually somewhat reddened, with superficial scaling and crusting. There was a tendency for central healing and peripheral extension, so that finally there were seen areas of almost normal skin surrounded by a collar of coarse scales with pustules and vesicles at the advancing border. The borders of these lesions were often polycyclic.

The lesions on the feet were often complicated by pyodermia-like changes with marked inflammation. In such cases, lymphangitis has been reported. My associates and I, however, have not seen this in our cases. It may be possible that the picture of pyodermia was not due to secondary infection, but to the fungi themselves—pustular folliculitis in kerion and sycosis produced by fungi (*Trichophyton gypseum*).

11. Sicoli, A.: Ann. de dermat. et syph. **5**:69 (Feb.) 1924.

Observations in Cases of Epidermophytosis of the Feet with Epidermophytids of the Hands

Case	Patient	Age	Sex	Date of First Examination	Clinical Syndrome				Fungi				Trichophytin Reaction	Comment
					Feet	Present Since	Hands	Present Since	Feet Mic.	Feet Culture	Hands Mic.	Hands Culture		
25	E. D.	28	♀	5/28/29	Intertriginous	?	Squamous	?	+	+	—	—	Positive	Trichophytin reaction positive after 3 days
26	M. B.	15	♀	5/31/29	Intertriginous dyshidrotic pustular	4 weeks	Dyshidrotic, squamous and pustular	A few days later	+	+	—	—	Strongly positive	August 10, discharged healed; returned September 2; recidive on the feet, in a day or so followed by dyshidrotic eruption on the hands which later went over to dyshidrosis lamellosa sicca
27	L. S.	19	♀	5/31/29	Intertriginous	.....	Dyshidrotic	.....	+	..	—	..	Positive	Trichophytin reaction weakly positive after 24 hours; June 10, strongly positive; no cultures made
28	T. O.	30	♀	6/ 1/29	Pustular dyshidrotic	3 weeks	Dyshidrotic	3 days	+	..	—	..	Positive	During 2 months of observation, several new eruptions of vesicles on the hands; no cultures made
29	G. P	21	♂	6/ 1/29	Intertriginous	2 years	Squamous	June 18	+	..	—	..	Positive	Changes on the hands appeared during treatment
30	L. F.	34	♀	6/ 6/29	Dyshidrotic pustular	6 weeks	At first dyshidrotic, then squamous	3 days	+	+	—	—	Very strongly positive, almost whole upper arm affected	After trichophytin reaction, temperature 37.3 C.; increased vesicles on hands
31	K. K.	8	♂	6/ 8/29	Intertriginous	2 weeks (?)	Dyshidrotic at first, then squamous	2 weeks	+	..	—	..	Strongly positive	After trichophytin reaction, temperature 39.1 C.; vesicular eruption on hands increased; new vesicles on feet; lichen trichophyticus on arms and back; no cultures made
32	J. S.	46	♂	6/10/29	Intertriginous	?	Dyshidrotic	8-10 days	+	+	—	—	Positive	Trichophytin reaction positive after 3 days; eruption on hands appeared during treatment
33	C. M.	25	♂	6/10/29	Intertriginous	4 to 5 weeks	Dyshidrotic	Aug. 16	+	+	—	—	Positive	Trichophytin reaction second day positive; recurrent eruptions on hands and feet
34	E. K.	29	♂	6/17/29	Intertriginous	?	Squamous	2 weeks	+	+	—	—	Strongly positive	Hands healed without local therapy; blood cultures negative

35	K.	30	♂	6/17/29	Intertriginous dyshidrotic	8 days	Dyshidrotic	1 day	+	—	—	—	Positive	After trichophytin reaction, increased vesicles on hands; new vesicles on feet of same character, also negative for fungi
36	K. G.	18	♂	6/24/29	Intertriginous pustular	4 weeks	Dyshidrotic with several pustules; later squamous	1 week	+	+	—	—	Strongly positive	Positive blood culture for E. Kaufmann-Wolf
37	A. F.	57	♀	6/27/29	Intertriginous	?	Squamous, somewhat eczematoid	Recurring attacks for 5 yrs.	+	—	—	—	Positive	Has been treated for recurrent eczema on hands for years; did not know she had any disease on feet
38	J. F.	63	♂	7/ 1/29	Dyshidrotic pustular	?	Squamous, dyshidrotic	2 to 3 months	+	+	—	+ (One tube positive)	Positive	Patient did not know he had any disease on feet
39	C. W.	14	♀	7/ 6/29	Pustular	3 to 4 months	Dyshidrotic	July 27	+	+	—	—	Positive	Reported last year as no. 23; eruption on hands appeared during treatment and healed without local therapy
40	J. W.	13	♀	7/ 6/29	Intertriginous	3 weeks	Dyshidrotic	July 23	+	+	—	—	Strongly positive	Eruption on hands appeared during treatment of feet and healed without local therapy
41	Dr. B.	..	♂	7/24/29	Intertriginous	4 mos.	Dyshidrotic, later squamous	14 days	+	+	—	—	Strongly positive	General reaction after trichophytin reaction; temperature 37.9 C.; headache, joint pains, general malaise, increased eruption on the hands
42	L. V.	26	♂	8/ 6/29	Intertriginous pustular	?	Squamous, dyshidrotic	1 year	+	--	—	—	Strongly positive	Patient showed at same time eczema marginatum
43	H. P.	24	♂	8/17/29	Intertriginous	1 month	Squamous, dyshidrotic	1 month	+	+	—	—	Positive after 3 days	
44	A. W.	36	♀	8/20/29	Intertriginous	?	Squamous, eczematoid	3 mos.	+	+	—	—	Strongly positive	Did not know she had any disease on feet; treated for eczema of the hand for years
45	A. H.	32	♀	9/ 9/29	Intertrigonius	10 days	Dyshidrotic	10 days	+	..	—	..	Strongly positive	No cultures made
46	Z. W.	50	♀	9/17/29	Intertriginous	?	Squamous	8 days	+	+	—	—	Strongly positive	Did not know she had any disease on feet
47	J. H.	12	♀	9/12/29	Intertriginous pustular	10 days	Dyshidrotic, later squamous	7 days	+	+	—	—	Strongly positive	Combined with generalized dyshidrotic epidermophytid; two blood cultures negative

The areas of predilection for the second group were the plantar region, the outer and inner borders of the foot, the region below the malleoli and the border of the toes toward the extensor surface.

Lesions on the Hands.—Here, also, there were found two main types of lesions: a dyshidrotic eruption which was identical with the picture of dyshidrosis (Tilbury Fox) or cheiropompholyx (Hutchinson) and a squamous form (dyshidrosis sicca lamellosa—Alexander). Such cases as the last named were first described by Seeman and Rajka [12] and Alexander.[6] The squamous form sometimes simulated the picture of postscarlatiniform desquamation.

Following is a brief extract of a case that was diagnosed as such by a competent authority.[13]

A boy, aged 8 years, who gave a history of having had a sore throat a week previous to examination, was taken from school and isolated by the city health officer with the diagnosis of postscarlatiniform desquamation. Although there was no history of a previous eruption on the body, the diagnosis was made from the coarse scaling on the hands, which was not to be differentiated from that sometimes seen after scarlet fever. At the same time, the boy presented on the feet a typical vesiculopustular mycosis which was microscopically and culturally positive for fungi *Epeidermophyton* Kaufmann-Wolf. The lesions on the hands were microscopically and culturally negative for fungi; the trichophytin reaction was strongly positive. Not until the Dick test was seen to be strongly positive and we had shown them other cases of the same type did the city health officer and the pediatricians who had also been called into consultation by the city health authorities agree to our diagnosis of epidermophytid secondary to mycosis of the foot.

The dyshidrotic type (fig. 1*B* and fig. 2) was characterized by its "sago grains," deep-lying vesicles. Through confluence of such small elements, large vesicles were often formed. The vesicles sometimes showed a herpetiform grouping; more often they appeared as scattered single elements, often arising from a normal skin. They often appeared in successive crops and showed a predilection for the sides of the fingers, their extensor surfaces, especially over the middle and distal phalanges, and the thenar eminence. Vesicles were also seen on the palms and backs of the hands, as well as over the flexor surface of the wrist joints. In some of the cases, the hands were thickly covered with closely neighboring vesicles.

When the eruption was slight—only along the sides of the fingers and deep-seated—it could be overlooked, if it was not especially looked for in all cases of mycosis of the feet. Such vesicles were found only on close examination in obliquely falling light.

12. Seeman, D., and Rajka, E.: Arch. f. Dermat. u. Syph. **143**:9, 1923.

13. This case was reported more in detail by Peck, S. M.: Klin. Wchnschr. **8**:1357 (July 16) 1929.

The vesicles were usually filled with a clear fluid, but I have seen several cases in which the condition on the hands was not to be distinguished from the pustular type on the feet. However, in such lesions, also, no fungi could be demonstrated.

The relation of this type, as well as of the squamous type, to eczema is discussed under "Histologic Changes" and under "The Relation Between the Epidermophytids, True Dyshidrosis and Eczema."

Fig. 2 (case 35).—Dyshidrotic epidermophytid; at the same time an intertriginous epidermophytosis on the feet.

In the majority of cases, the dyshidrotic condition developed into the squamous form. This type could apparently appear primarily without any previous appearance of vesicles.

The primary squamous form (fig. 3) either showed a superficial scaling of the skin—"desquamatio areata manuum"—with almost no inflammatory reddening or presented irregular areas from 1 to 4 cm. in diameter, round or oval, in which the skin usually showed more redness

than in the first type and was surrounded by a collar of coarse scales. Alexander [6] gave the name of dyshidrosis sicca lamellosa to such lesions. It sometimes simulated the picture of postscarlet fever desquamation (fig. 4). The squamous form was often seen on the palms, but it was also found on the dorsa of the hands, on the fingers and on the flexor surface of the wrist joints.

When the squamous type was localized on the backs of the fingers, it often assumed a more eczematoid character, so much so that it became routine in our clinic to examine all patients who had eczema-like erup-

Fig. 3 (case 46).—Primary squamous epidermophytid; an intertriginous epidermophytosis on the feet at the same time.

tions on the hands, which were not evident eczemas, for possible mycosis of the feet. While pyodermia-like changes were also observed in a few cases, they were rare as compared with this occurrence on the feet.

On the feet there were observed from time to time vesicular eruptions which were negative for fungi. These eruptions were almost never found on the areas of predilection of the epidermophytosis of the feet, but were scattered peripherally from it—scattered vesicles on the toes, dorsa of the feet, soles, etc., not as grouped lesions, but irregularly disseminated. These may have been present at the first examination or may have appeared after a trichophytin reaction coincident with similar eruptions on the hands. The negative observations for

fungi are explained, as Williams has already proposed, when one regards them also as epidermophytids. It is of practical importance to bear this fact in mind when looking for fungi. The lesions giving the best results were those situated along the advancing border of the epidermophytosis.

REPORT OF CASES

Williams,[5] Rajka,[14] Alexander,[6] Walthard [4] and Jadassohn and Peck [10] reported cases of mycosis of the feet with generalized trichophytids (epidermophytids). I should like to describe briefly such a case which is included in the present series.

Fig. 4 (case 47).—Squamous epidermophytid resembling postscarlatiniform desquamation. The patient presented on admittance an intertriginous pustular epidermophytosis and a generalized vesicular epidermophytid; on the hands, the typical picture of dyshidrosis.

Case 1.—A girl (case 47), aged 12 years, was admitted to the clinic on Sept. 12, 1929, with a generalized eruption. Ten days before admission, the parents first noted an eruption on both her feet; three days later, it appeared on the hands and soon after became generalized.

The whole body, with the exception of the face and the scalp, was affected. Between the toes and along the outer margins of both feet, the patient presented the typical picture of intertriginous pustular mycosis. On the dorsa and soles and on the legs, arms and hands there was a vesicular eruption; on the hands, it had the character of a dyshidrosis—most of the vesicles showed a zone of hyperemia. The flexor surfaces of the extremities were more affected than the extensor surfaces. The eruption on the body resembled that of a toxic exanthem —pinpoint areas of erythema, papules partly follicular and many vesicles. On

14. Rajka, E.: Dermat. Wchnschr. **76**:574, 1923.

the sternum and the abdomen were seen elements resembling a lichen trichophyticus. The part of the sternum and neck which was exposed to light showed a generalized reddening, edema and a great many closely adjacent vesicles.

There was a general lymphatic enlargement. On the patient's admission to the clinic, the temperature was normal, but it soon rose to 38 C. (100.4 F.).

Fungi were easily demonstrated microscopically and culturally in the lesions on the toes; all the other lesions were negative for fungi. The trichophytin reaction was strongly positive. Several blood cultures remained sterile.

In the course of from one week to ten days, while the feet were being treated antiparasitically, the general eruption subsided with desquamation, which was most marked on the hands, where it assumed the picture of postscarlatiniform desquamation (fig. 4). Long after nothing more was to be seen on the rest of the body, the hands still showed marked scaling.

CASE 2.—The patient (case 42) showed, in addition to mycosis of the feet and squamous epidermophytid on the hands, eczema marginatum of the inguinal scrotal region. Fungi were demonstrated in the lesions of the feet and those of the inguinal region, while the lesions of the hands were negative for fungi. The trichophytin reaction was strongly positive. Unfortunately, although cultures were taken from all the affected regions, they remained sterile, so that the fungi could not be identified.

This is the only case of the forty-four studied in which an eczema marginatum was combined with a mycologic involvement of the feet. *Epidermophyton inguinale* and *Epidermophyton* Kaufmann-Wolf belong to that group of fungi which cause epidermomycoses and do not invade the hair. Both have also been found as the cause of the dyshidrotic mycoses of the hands and feet, but they are not identical (Bruhns and Alexander [15]).

The next case is reported in detail because I believe that it represents a primary dyshidrotic pustular mycosis on the left hand with an epidermophytid on the right hand and the left foot.

CASE 3.—A woman, aged 50, was seen in the outpatient department on May 29, 1929, with a vesiculopustular eruption on the left hand, which had been present for three weeks. Along the sides and on the backs of the fingers of the left hand were many grouped pustules and vesicles varying in size from that of a pinhead to that of a pea; the pustules usually showed a zone of erythema. In places, the skin was reddened and scaling. A few scattered vesicles and pustules were seen on the palm and the dorsum. The clinical picture resembled very much that of the vesiculopustular foot mycosis. The right hand showed just a few scattered vesicles along the sides of the fingers, which the patient said had been present for a few days. Outside of some maceration between the toes, the feet were normal. Fungi were easily demonstrated microscopically in the lesions on the left hand; [16] long search of the vesicles of the right hand, as well as of

15. Bruhns and Alexander: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1928, vol. 11, p. 208.

16. This positive result shows that it is not the special localization on the hands (as Sabouraud maintained) (see p. 7) which makes the demonstration of fungi so difficult or impossible.

the macerated skin between the toes, was negative for fungi. Cultures were made from all the affected regions. The trichophytin reaction was strongly positive. The left hand was treated with antiparasitic measures.

On June 12, 1929, there developed on the right hand the typical picture of the dyshidrotic epidermophytids—"sago grains," singly and in groups, situated along the sides of the fingers and on the thenar eminence. At the same time, there was seen on the inner side of the left foot, on the dorsum and on the opposing surfaces of its first and second toes a dyshidrotic eruption like that on the right hand. Microscopic examination of the lesions of the right hand and left foot was negative for fungi. Cultures were again made from these two regions. Only the cultures made from the primary mycosis on the left hand, on May 29, 1929, were positive; they could be identified as *Epidermophyton* Kaufmann-Wolf.

The left hand healed under antiparasitic treatment; the manifestation on the right hand and left foot healed without treatment.

The investigations of the twenty-three cases here reported have substantiated the observations of Jadassohn and Peck [10] which were given in the introduction. It can be definitely stated now that the Kaufmann-Wolf fungus has a special tendency to produce an allergic state in the infected organism, even though the lesions seem superficial. This is seen from the positive trichophytin reaction in the forty-seven cases studied, in thirty-two of which *Epidermophyton* Kaufmann-Wolf was isolated. This observation is further substantiated in the mycosis of the feet experimentally produced by von Graffenried [8] and myself with this organism.

The trichophytin used was made in our own laboratories, from *Achorian quinckeanum,* according to the method of Bloch.[17] One-tenth cubic centimeter was injected intracutaneously as in the Schick test, forming a wheal; the reaction was read in from twenty-four hours to five days, as late reactions were sometimes seen. To avoid a pseudoreaction—sensitivity to maltose bouillon—0.1 cc. of this substance was injected intracutaneously as a control. Only in two or three cases was a red pea-sized papule seen at the site of the control injection. It disappeared in twenty-four hours, however, and the difference between the controls and the trichophytin reaction was so marked that there was no question of a pseudoreaction.

This year (1929) also, six cases of dyshidrotic or squamous changes on the hands and intertriginous or pustular manifestations on the feet were seen, which microscopically and culturally were negative for fungi. The trichophytin reaction in these cases was positive. Treatment as for primary mycosis of the feet with epidermophytids on the hands gave good therapeutic results. During our studies in 1928, we saw only six cases of mycosis of the feet which had no accompanying manifestations on the hands; during 1929, I saw only five. Of these five cases, three showed a positive trichophytin reaction.

17. Bloch (footnote 2, first reference, p. 342).

HISTOLOGIC CHANGES

The histologic picture of the mycotic dyshidrosis has already been well described by Kaufmann-Wolf,[18] von Graffenried,[3] Alexander,[6] Sicoli [11] and Gans.[19] Recently, Miescher [20] summed up the observations of the various authors in his general review of trichophyton and epidermophyton infections. The histologic changes of the epidermophytids, however, have as yet not been described, except perhaps in those cases in which they have been reported as true dyshidrosis.

Material Studied.—Five excisions from lesions on the feet: vesicles from the big toe, from the dorsum of the foot, from the base of the toes and from the flexor surface of the toes, and two vesicles from the periphery of an advancing lesion on the plantar surface. Three excisions from lesions on the hands: two of dyshidrotic vesicles from the sides of the fingers and one of the primary squamous type on the dorsum of the hand.

Technic.—The material was fixed in alcohol, embedded in paraffin and stained with hematoxylin and eosin and Weigert's elastica. The best results for fungi were obtained by standing with polychrome methylene blue for from ten to twenty minutes and differentiation with glycerin ether under microscopic control. In some sections, in order to bring out the fungi, differentiation had to be carried out until the epidermis itself was decolorized; counterstaining with ordinary hemalum gave a good epidermal stain without obscuring the fungi. Fungi could also be demonstrated with Löffler's methylene blue, carbol-methyl green-pyronin, Giemsa's or Gram's stain or even an ordinary hemalum eosin preparation; but the results were not so good as with the first-named stain—either the contrast was not enough between the fungi and the surrounding tissue or they did not take the stain well. When they were unstained, they could often be seen with the condenser brought way down or removed altogether because of their light refractive power.

Primary Mycosis of the Feet.—The most characteristic observation in primary mycosis on the feet was the formation of epidermal vesicles. In serial sections, their formation could be followed from intracellular edema and spongiosis of the cells in the prickle cell layer. The walls of the vesicles were formed by the surrounding epidermis. Depending on their size, the roof consisted of a few layers of stratum granulosum plus the keratin layer or only the keratin layer. Large vesicles covering several papilli were formed by the breaking through of the thin walls of adjacent smaller ones. The vesicles contained fibrin, polymorphonuclear leukocytes and epithelial cells in various stages of degeneration.

Near the vesicles there were infiltrations of polymorphonuclear cells in the epidermis. The horny layer showed scattered parakeratotic points, and vesicles in various stages of drying. In serial sections, it could be seen that these were gradually pushed up into the corneal

18. Kaufmann-Wolf, M.: Dermat. Ztschr. **21**:385, 1914.

19. Gans, O.: Histologie der Hautkrankheiten, Berlin, Julius Springer, 1928, vol. 2, p. 61.

20. Miescher (footnote 9, p. 513).

layer from the deeper layers of the epidermis by the upgrowth of cells. Often the horny layer was split by serum accumulations.

There was a cellular exudate in the cutis, consisting of polymorphonuclear cells and some lymphocytes, which was usually most marked in the papillary and subpapillary layers directly beneath the vesicles. There was also some increase in the fibroblasts. The blood vessels were dilated and often showed a perivascular infiltration of polymorphonuclear cells and lymphocytes. The elastic fibers were unchanged. A number of sweat ducts were seen which were normal.

Fungi were found only in the sections taken from the plantar region. Except for this observation, no difference was seen between the fungus-positive and the fungus-negative sections. Fungi were found in some sections in fairly large numbers. For the most part, they were situated in the upper two thirds of the stratum corneum, but they were also seen as far down as the upper layer of the stratum granulosum—not between living cells (fig. 5). In one section, they were seen between the cells of the stratum granulosum which formed the roof of a vesicle and penetrating into the vesicle itself. The fungi were seen in long and short chains running parallel to the surface; they were segmented and contained granules. The granules, as well as the borders of the mycelia, took the polychrome stain intensely. There was no relationship between the number of fungi in the keratin layers and the degree of the pathologic changes in the underlying epidermis. This was also true for the parakeratosis.

Vesicular Epidermophytids.—The histologic character of the dyshidrotic changes on the hands was not different from that of the primary mycotic dyshidrosis, except for the absence of fungi. The changes closely resembled the classic descriptions of the amycotic dyshidrosis given by Alexander [21] and Gans [22] (fig. 6).

The changes in the vesicular type began with multiple foci of hydropic swelling, intracellular edema and spongiosis of the cells of the prickle cell layer. This went on to vesicle formation. At the time when there was still only a swelling of cells with spongiosis, there was already a wandering of polymorphonuclear leukocytes from the cutis into the epidermis at those points. At the areas of beginning vesicle formation, the epidermis seemed widened because of the separation of the cellular elements. There was less parakeratosis than in the lesions on the feet, but this was probably due to the fact that we were dealing with a younger process. The changes in the cutis were like those described for the primary mycotic lesions on the feet. No relationship was seen between vesicle formation and sweat ducts; a number of

21. Alexander, A.: Dermat. Ztschr. **50**:185, 1927.
22. Gans (footnote 19, p. 287).

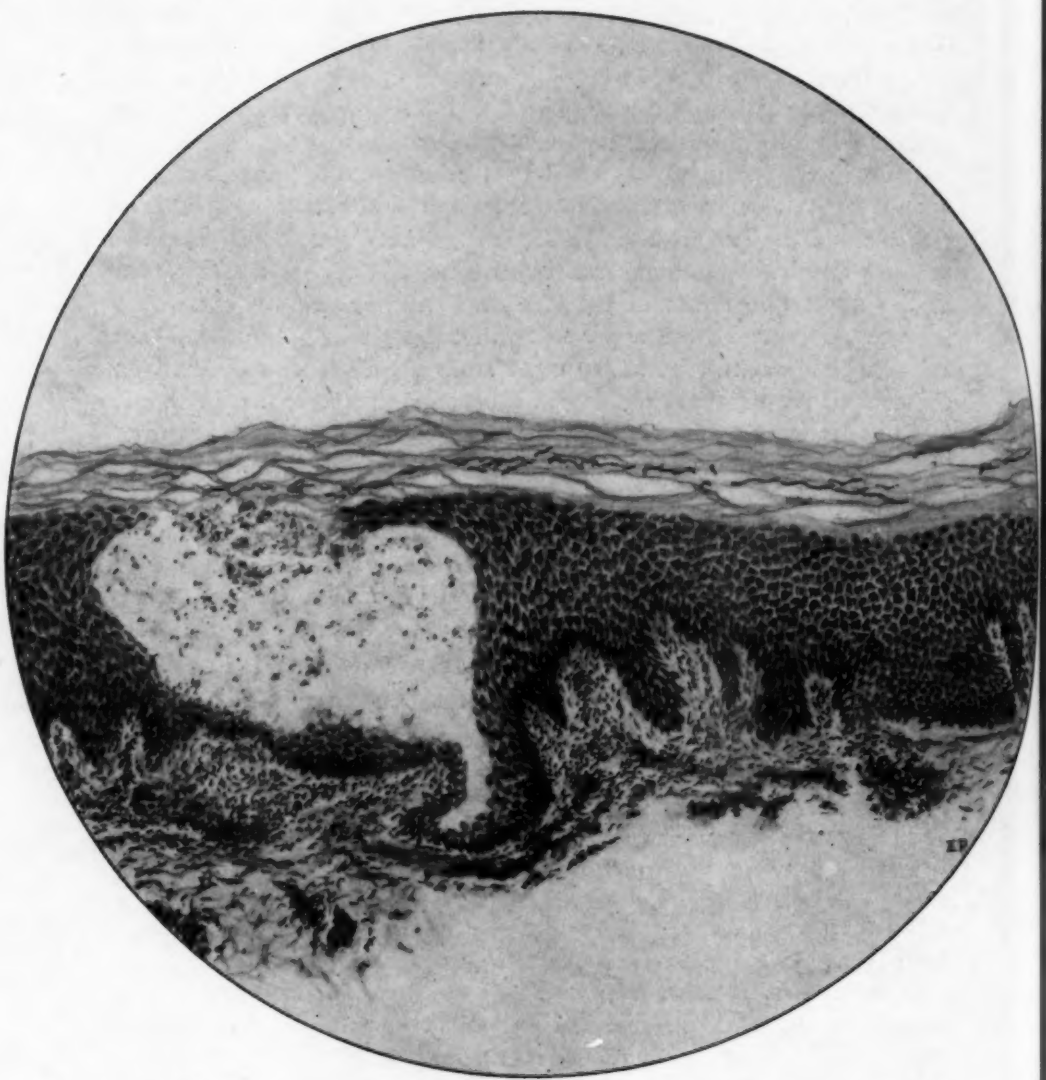

Fig. 5.—Section from a vesicle on the plantar region of the foot; fungi in the horny layer. Polychrome methylene blue. Orthoscopic ocular 17 ×; objective A 80, 20 (Zeiss).

sweat ducts were seen which were normal. Careful search for fungi with all of the staining methods mentioned revealed none.

Primary Squamous Epidermophytids.—The characteristic histologic change of this form was the subcorneal vesicle formation and the abortive vesicle formation in the stratum malpighii. The stratum corneum showed hyperkeratosis and scattered parakeratotic points. Right below the stratum corneum there were seen vesicles which never exceeded microscopic proportions. In the stratum malpighii there were circumscribed areas of spongiosis which showed an infiltration of polymorphonuclear cells. These processes began in the basal and over-

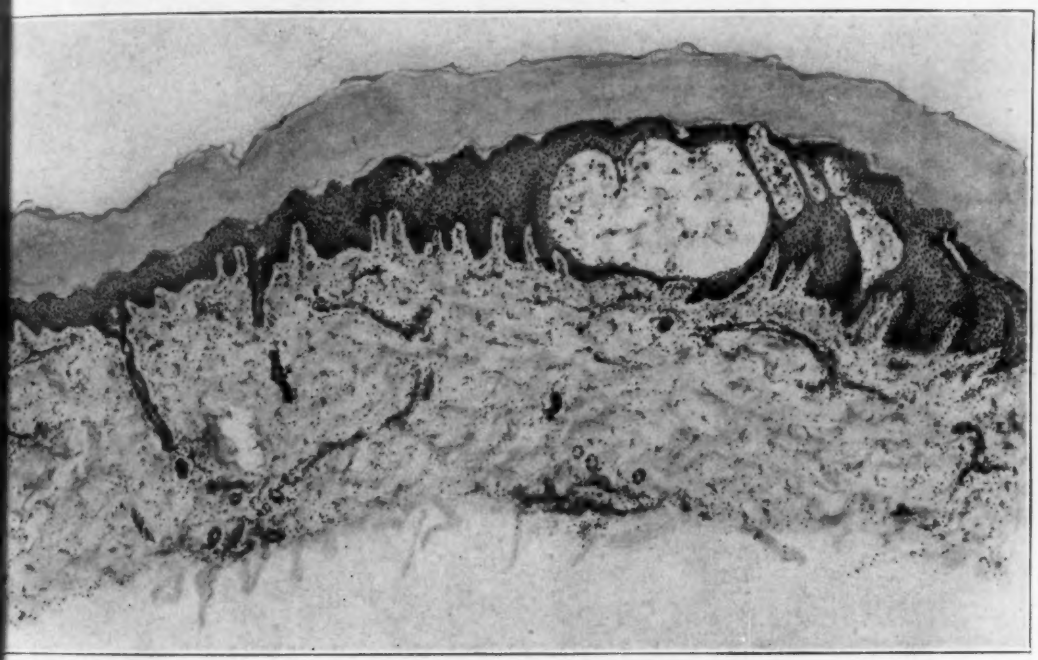

Fig. 6.—Low power magnification of a section from dyshidrotic vesicles on the hands; beginning vesicle formation and intra-epidermal vesicles; cellular exudate in the papillary and subpapillary layers of the cutis; normal sweat ducts. Hematoxylin and eosin; orthoscopic ocular 17 × Lupe (Zeiss).

lying layers, lower down than in the vesicular epidermophytids, but in places extended up to the stratum granulosum. It is to be emphasized that the process did not go beyond a spongiosis. Parakeratotic points and subcorneal vesicles were often seen above the areas of spongiosis in the stratum malpighii. The cutis showed an exudate of polymorphonuclear cells and lymphocytes in the papillary and subpapillary layers, most marked directly under the areas of abortive vesicle formation in the epidermis. The elastica was normal. The sweat ducts were normal. No fungi were demonstrated (fig. 7).

It is seen that essentially the vesicular and the squamous epidermophytids have the same changes; and the clinical appearance of the primary squamous form is explained by the abortive vesicle formation in the deeper layer of the epidermis and the microscopic size of the subcorneal vesicles.

The histologic changes bear a striking resemblance to those of "dyshidrotic" eczema-spongiosis, vesicle formation and parakeratosis.

Fig. 7.—Section from a primary squamous epidermophytid on the hands; spongiosis and polymorphonuclear leukocytic infiltration of the epidermis (abortive vesicle formation); subcorneal vesicles. Hematoxylin and eosin; ocular 7 ×; objective D 40, 0.65, 0.17 (Zeiss).

Perhaps the leukocytic infiltration of the epidermis is seen earlier and forms a more striking part of the histologic picture than in eczema. However, in acute eczemas, especially those seen after contact with primrose, one may also have an early leukocytic infiltration of the epidermis.

MYCOLOGIC STUDIES

Cultures were taken on Sabouraud's maltose agar; in each case from twelve to fifteen culture tubes were planted from lesions on the feet and

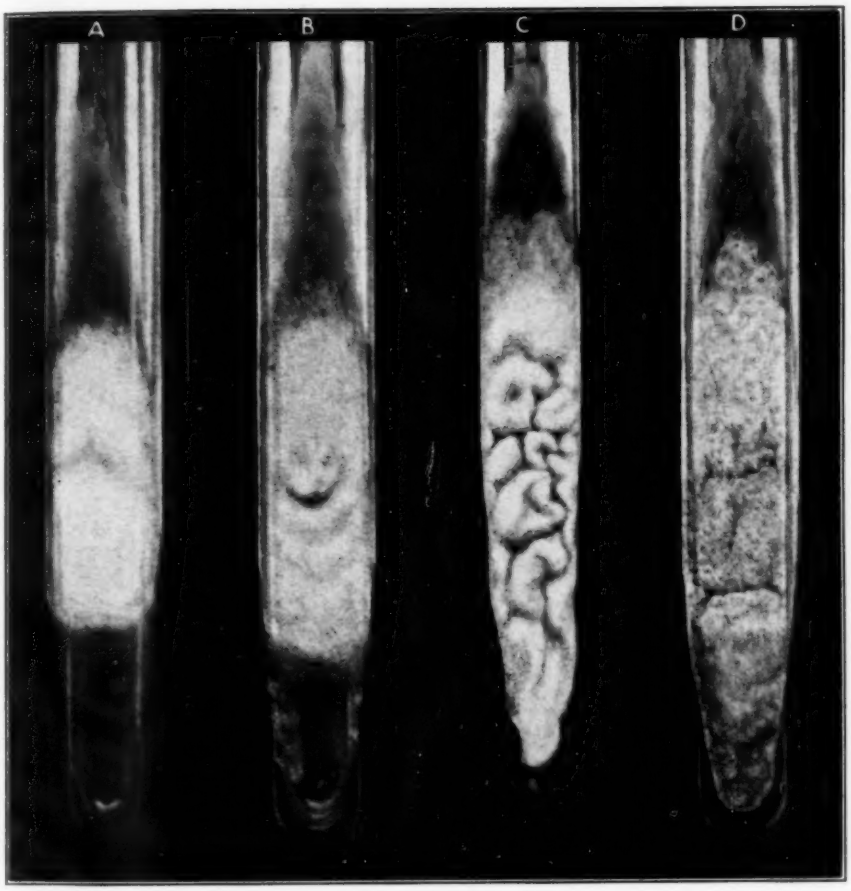

Fig. 8.—Epidermophyton Kaufmann-Wolf: (*A*) Achorion quinckeanum type; (*B*) Trichophyton gypseum type; (*C*) cerebriform type; (*D*) red granular form.

UNIV. OF MICH.

an equal number from lesions on the hands. The hands gave negative cultures, with the exception of one vesicle from the hands in case 38. From the feet in this case, six culture tubes gave a positive culture of the same fungus as that from the hands. From the feet in fifteen of the cases here reported, the same fungus—*Epidermophyton* Kaufmann-Wolf—was cultivated. In the series studied in 1928, seventeen positive cultures for this organism were obtained. No other hyphomycete was cultured from the forty-nine cases studied. The pleomorphism of the organism was remarkable; all of the varieties described by Bruhns and Alexander [15] were seen. Often two of the varieties and in several cases all three were isolated from the same case. The colonies often appeared after a few days, and in three weeks, on slant cultures, they sometimes reached the size of from 6 to 7 cm.

Macroscopic Appearance.—Three main types were seen: (1) a colony that strongly resembled *Achorion quinckeanum,* with a white downy surface, often showing a central mound and having a tendency to ring formation; (2) one that resembled *Trichophyton gypseum,* powdery, with a tinge of yellow, and also showing a tendency to ring formation; (3) a cerebriform type, grayish white with a smoother surface and shorter aerial hyphae than the first group (fig. 8). The older cultures of group 1 showed a tendency to assume a light rose color.

From the feet in one of the cases, along with pure cultures of *Trichophyton gypseum,* on most of the Sabouraud slants, I was able to isolate in one tube a type (4) which was unlike that seen in any of the other cultures. This was a rather slow-growing fungus which covered the whole surface of the slant—7 cm.—in five weeks. It showed on a background of pinkish white many superimposed coarse granules of a deeper pink. The granules were about the size of grains of sand, much coarser than the fine granulation of the *Trichophyton gypseum* variety (fig. 8*D*). With age the culture became more orange and finally a light lemon yellow. Subcultures of the 3 months old culture on three Sabouraud maltose agar slants gave rise to the *Achorion quinckeanum* form, to one resembling the primary culture but with redder granules and to one having a white, downy center and a red granular periphery which soon developed into the *Achorion quinckeanum* form.

Microscopic Appearance.—The microscopic picture of the various cultures showed all the characteristics which are described for *Epidermophyton* Kaufmann-Wolf by Bruhns and Alexander: [15] long and short, branched and straight mycelia, ectospores situated on the sides and "en grappes," spores lying free singly and in groups, and chlamydospores intercalated, terminal and lying free; spiral formation was found only occasionally.

Only in type 4 were spindles seen; the great number of them was the most striking part of the microscopic picture. Examination of the 5 weeks old culture showed straight and serpentine mycelia sometimes branching, spindles lying free, attached directly on mycelia or given off from the side singly and in bunches of three or four; the spindles usually showed two chambers. Many of the mycelia showed terminal swelling, ectospores and chlamydospores.

The presence of the spindles in this culture brings out what Grutz [23] has pointed out: when one has a great number of spindles microscopically, the culture appears coarsely granular macroscopically.

Animal Experiments.—An attempt was made to inoculate the skin on the backs of six guinea-pigs with cultures 3, 4 and 5 weeks old, of the various strains of fungi isolated, according to the method of Bloch. The 3 weeks old cultures were of the *Trichophyton gypseum* variety, while the 4 and 5 weeks old cultures were of the *Achorion quinckeanum* type. All the attempts gave negative results.

According to Bruhns and Alexander,[15] the Kaufmann-Wolf fungus was sometimes pathogenic for animals; the "take" in those cases did not affect the hairs and had a short course. Walthard [4] also obtained negative results in inoculations of animals, with his strain of *Epidermophyton* Kaufmann-Wolf. The behavior of the Kaufmann-Wolf fungus in inoculations of animals, as well as its location in the human lesions, classifies it with *Epidermophyton*.

DEMONSTRATION OF FUNGI IN THE BLOOD STREAM IN EPIDERMOPHYTOSIS OF THE FEET WITH EPIDERMOPHYTIDS ON THE HANDS

In case 36 it has been possible to culture *Epidermophyton* Kaufmann-Wolf not only from the lesions on the feet, but also from the circulating blood. With this result, it has been shown that epidermophytids of dyshidrotic and squamous character can arise on the hands through the hematogenous transport of living fungous elements from a primary mycosis of the foot.

Following is a brief summary of the chief data of this case: [24]

A boy, aged 18, was admitted to the hospital on June 24, 1929, with an extensive mycosis of both feet partly intertriginous and partly vesiculopustular (fig. 1*A*), which had been present for four weeks; the lesions on the feet were microscopically positive for fungi, and cultures yielded *Epidermophyton* Kaufmann-Wolf of the *Trichophyton gypseum* and *Achorion quinckeanum variety*. The hands presented a generalized eruption, dyshidrotic, with scattered pustules and con-

23. Grutz, quoted by Bruhns and Alexander (footnote 15, p. 208).

24. A brief summary of this case has appeared in Klin. Wchnschr. **41**:1905 (Oct. 8) 1929; it is repeated here with a more complete description of the fungus isolated from the circulating blood.

fluent vesicles on the fingers and the hands as far as the wrist joint. Repeated microscopic and cultural search for fungi from the lesions on the hands disclosed none. The trichophytin reaction was strongly positive. In analogy to the other case, it was interpreted as a primary mycosis of the feet with an epidermophytid on the hands.

Two hours after the trichophytin reaction was made, blood cultures were taken on Sabouraud's maltose agar, under aseptic conditions. On one of the blood plates there developed a fungus which is to be described.

Macroscopic Appearance.—The fungus in its primary culture, as well as in its subcultures, was characterized by rapid growth: In nine days, in a flask on Sabouraud's maltose agar, it reached a diameter of

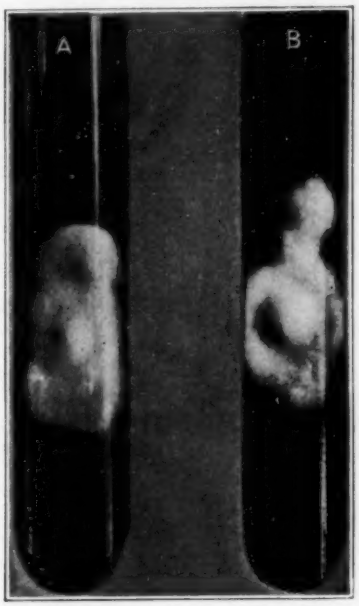

Fig. 9.—(*A*) 16 day old subculture on Sabouraud's maltose agar, of Epidermophyton Kaufmann-Wolf isolated from lesions on the feet; (*B*) 7 day old subculture on Sabouraud's maltose agar of Epidermophyton Kaufmann-Wolf isolated from the circulating blood in case 36.

5 cm. On Sabouraud's maltose agar slants, it also grew rapidly, reaching a length of 7 cm. in two weeks. The culture was white and downy, with a central mound, a tendency to ring formation and marked production of aerial hyphae (fig. 9). In subcutures on maltose agar from the eleventh to the twentieth day, it showed a tendency to assume a faint pink color. The *Achorion quinckeanum* character was retained in the subcultures.

Microscopic Appearance.—On the twelfth day there were seen fine, occasionally branching mycelia, ectospores situated along the sides and

terminal, also spores lying free singly and in groups. In the subcultures there were seen, in addition, chlamydospores intercalated and terminal.

Macroscopic, as well as microscopic, comparison of this culture with that isolated from the lesions of the feet showed complete identity.

It is interesting to note that the fungus isolated from the circulating blood showed a faster rate of growth than that isolated from the feet. This is contrary to the conclusion Jessner and Hoffmann [25] drew from their work, which deals, however, not with *Epidermophyton* but with *Achorion gypseum*.

EXPERIMENTAL EPIDERMOPHYTOSIS WITH EPIDERMOPHYTIDS ON THE HANDS

EXPER. 1.—M. H., a girl, aged 17, under treatment for gonorrhea, volunteered for this experiment. The Wassermann reaction was negative.

On July 1, 1929, the trichophytin reaction, at the beginning of the experiment, was negative. A 3 weeks old culture of the Kaufmann-Wolf fungus (*Trichophyton gypseum* type) which had been isolated from a case of mycosis of the feet was used. The culture plus Sabouraud's mediums was put between the first and second and the third and fourth toes of the right foot and between the first and second and the fourth and fifth toes of the left foot. The toes were then kept in close contact with adhesive tape. A thick flannel cloth was then wrapped around each foot and the whole bandaged. The girl was then told to walk about as much as possible. The month of July was hot, so that all the conditions necessary for local perspiration and maceration were present. During the next few days, the girl complained of itching and burning in both feet.

On July 4, the coverings and adhesive tape were removed from both feet. On the right foot, the skin between and on the sides of the toes showed a great deal of maceration. The opposing surfaces of the first and second toes were covered with small vesicles and pustules having a sort of linear arrangement. Such vesicles and pustules were also seen on the sides of the third and the fourth toes. On the left foot, the same degree of maceration and reddening was seen on the sides of the toes as on the right foot. The opposing surfaces of the first and second toes showed just a few vesicles and pustules. The fourth interspace showed marked reddening and maceration, but no vesicles or pustules were seen. Microscopically, fungi in great numbers were seen in the roofs of vesicles and pustules of both feet.

On July 12, the changes on both feet began to assume more of the character of the intertriginous mycosis of the feet, a great deal of scaling with few vesicles and pustules (fig. 10).

Microscopically, many fungi were observed in the scales. The hands were normal. The trichophytin reaction was made with 0.1 trichophytin (Bloch) intracutaneously on the outer surface of the right upper arm.

On July 13, the trichophytin reaction showed an area of redness, 3 cm. in diameter, somewhat raised and slightly infiltrated. The hands were negative for fungi.

On July 18, the feet were about the same. In the roofs of vesicles and pustules, as well as in the scales, fungi were easily demonstrated. The hands were negative for fungi.

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25. Jessner, M., and Hoffmann, H.: Arch. f. Dermat. u. Syph. **145**:187, 1924.

On July 22, the left foot showed in the first interspace, especially on the sides of the toes, scattered pustules. The intertriginous changes had spread to the flexor surface of the second and third toes and to the ball of the foot below these toes. Small groups of pustules were also seen on the dorsum of the second toe. The right foot showed little more than superficial scaling on opposing surfaces of some of the toes. The hands were negative for fungi.

On July 24, the process on the left foot had progressed still further. The right foot was about the same.

Hands: On the dorsum of the right hand were seen a few deep-lying vesicles about the size of a pinhead. On the sides of the second and third fingers facing each other were also several deep-lying, pinhead-sized vesicles—all negative for fungi.

On July 26, the trichophytin test was repeated on the upper left arm, and a control made on the upper right arm with maltose bouillon.

Fig. 10.—Experimental epidermophytosis in patient M. H., first infection (July 12, 1929); the lesions between the toes have the character of the intertriginous epidermophytosis; positive for fungi.

On July 27, the trichophytin reaction showed an area 6 cm. in diameter, deep red, elevated and definitely infiltrated. It was surrounded by a broad bluish-red zone of erythema which gradually lost itself in the normal skin. Local pain and a rise in temperature were present. The control test showed a pea-sized, red papule, with no pain or local rise in temperature. The condition of the hands remained unchanged.

On August 5, the left foot showed a typical picture of the intertriginous mycosis, especially in the first interspace. In the scales, fungi were easily demonstrated. The right foot, aside from several pustules and dried and ruptured vesicles, was normal. One gets a definite impression that the process varied in its clinical picture almost from day to day. Vesicles appeared and disappeared, became pustular and went on to scaling. The patient had no subjective symptoms.

Cultures were made.

On August 10, the feet showed spontaneous healing. Several new vesicles had appeared on the sides of the fingers of the left hand. These also were negative for fungi.

On August 20, the trichophytin reaction was repeated and still was strongly positive after twenty-four hours. The controls were negative. The hands were negative for fungi. The feet showed just a little scaling between some of the toes.

On August 27, a culture made on August 5 showed a positive growth of *Epidermophyton* Kaufmann-Wolf of the *Achorion quinckeanum* type. The hands were negative for fungi. Practically nothing was to be seen on the feet, and no fungi could be demonstrated microscopically in the scales.

Summary.—Mycosis of the foot was produced with *Epidermophyton* Kaufmann-Wolf on a patient with a negative trichophytin reaction. The disease at its height resembled the intertriginous dermatomycosis of the feet plus some vesicular and pustular elements. Four days after the beginning of the experiment, there were seen on the feet, vesicles and pustules which were microscopically positive for fungi. The lesions on the feet reached their acme in twenty-four days. Fungi could still be demonstrated a week later, and cultures taken from the vesicles and scales at that time yielded a growth of *Epidermophyton* Kaufmann-Wolf in nearly every culture tube. The lesions on the feet healed spontaneously in two months. While the original cultures used for the infection were of the *Trichophyton gypseum* variety, those reisolated were of the *Achorion quinckeanum* type.[26] Thirteen days after the beginning of the experiment, the trichophytin reaction became positive; in the following weeks, it became stronger, demonstrating an increased degree of allergy, and it was still strongly positive at the conclusion of the experiment, two months after its inception. Twenty-four days after the beginning of the experiment, a few dyshidrotic vesicles appeared on the fingers of the right hand. During the next two weeks, a few scattered deep-lying vesicles appeared in successive crops on both hands and disappeared without visible desquamation. The vesicles on the hands were microscopically negative for fungi.

EXPER. 2.—The same patient as in experiment 1 was used. On Aug. 27, 1929, under the same procedure as in experiment 1, her feet were infected for the second time with the cultures of *Epidermophyton* Kaufmann-Wolf isolated from her on August 5.

On September 1, the degree of inflammatory reaction on both feet, as compared with that observed in the first experiment, was striking. On the left foot, there was a great degree of maceration and inflammation of the skin on the sides and on the flexor surfaces of the toes. The appearance of the lesions was like that of the intertriginous vesiculopustular mycosis of the feet with a marked inflammatory component. There were seen in the folds, on the sides of the toes and on the flexor surfaces, redness, swelling, formation of pustules

26. Weidman (Morphologic Variations in a Ringworm Species of the Toes, Followed in Primary Cultures Over a Period of Years, Arch. Dermat. & Syph. **13**:374 [March] 1926) also found that after culturing the downy variety of Epidermophyton Kaufmann-Wolf from his toes over a period of years, the subsequent cultures were of the granular (Trichophyton gypseum) variety.

and vesicles and a great deal of oozing, crusting and fissure formation. The right foot was less affected, but the changes were much more marked than in the previous experiment.

The patient complained of pain, itching and burning in both feet. From this time on, she was kept in bed. The feet were untreated and kept bandaged. The bandages were removed only at the time of examination. During the course of the experiment the patient was closely watched, so that as far as could be judged there was no contact between the hands and the feet during this whole period.

Fig. 11.—Experimental epidermophytosis in patient M. H., second infection (Sept. 3, 1929); the lesions have the character of the intertriginous vesiculopustular epideromphytosis; positive for fungi.

On September 6, the process on both feet showed a steady increase in the inflammatory component, as well as in the number of vesicles and pustules. Not only the toes, but the interdigital spaces and the dorsum, as well as the ball, of the foot showed a great number of vesicles and pustules (fig. 11). The process was active, vesicles appearing, drying up and new crops arising from day to day. Microscopically, although fungi were demonstrated, they were harder to find than in experiment 1. The hands were normal.

On September 9, the changes on the feet were subsiding somewhat, but there was still a great number of vesicles and pustules, as well as intertriginous changes.

Hands: There was a distinct dyshidrotic eruption on both hands; on the sides of nearly all of the fingers, as well as on their dorsa and on the thenar eminences, there were many pinhead-sized and larger, deeply lying vesicles of the typical sago grain type. For the most part, they were single and scattered, but there was some herpetiform grouping. The majority of the vesicles arose from a normal skin; a few showed a narrow zone of erythema (fig. 12).

Histologic examination of one of the vesicles on the sides of the fingers showed a picture identical with that of the dyshidrotic epidermophytids in the clinical cases. Here, too, vesicle formation began in the prickle cell layer, while the overlying layers showed no pathologic changes. Microscopically, no fungi were demonstrated in the vesicles on the hands.

Fig. 12.—Dyshidrotic epidermophytid on the hands of patient M. H. (Sept. 11, 1929) with experimentally produced mycosis of the feet; the lesions on the hands were negative for fungi.

On September 12, the vesicles on the hands had increased in number. Fungi were microscopically present in the lesions of the feet and absent in those of the hands. Cultures were made from the lesions on the hands and on the feet.

On September 17, the vesicles on the hands had for the most part disappeared. The feet were treated antiparasitically. The trichophyton reaction was strongly positive after twenty-four hours. Blood cultures were taken three hours after the trichophyton test was made.

On September 23, the cultures from the feet were positive for the Kaufmann-Wolf fungus of the *Achorion quinckeanum* type. The cultures from the hands, as well as those from the blood, remained negative.

On September 25, at the site of the vesicles on the sides of the fingers there were scattered areas of desquamation.

On October 10, the lesions on the feet had practically healed, and the hands were normal.

Summary.—A reinfection was produced on the feet of the patient used for the first experiment with a 3 weeks old culture of *Epidermophyton* Kaufmann-Wolf isolated from the first foot mycosis. The reinfection was characterized from the beginning by its greater inflammatory component as compared with the first infection. The changes on the feet reached their acme in from six to seven days. At their height, they presented the picture of the intertriginous vesiculopustular foot mycosis. The vesiculopustular element was much more in the foreground than in experiment 1. Fungi could be demonstrated in the lesions on the feet microscopically and culturally sixteen days after the beginning of the experiment, just before antiparasitic measures were instituted. The fungi, however, were more difficult to find than in experiment 1. Two weeks after the beginning of the experiment, a generalized dyshidrotic eruption developed on both the hands (fig. 12). Clinically and histologically, it was the same as that seen in the clinical cases. The eruption remained on the hands for eight days and then disappeared with desquamation. The lesions on the hands were microscopically and culturally negative for fungi. The trichophytin reaction at the end of the experiment was still strongly positive.

COMMENT

Pathogenesis of the Manifestations on the Hands.—As was stated in the introduction, the present investigations were undertaken in an attempt to cast more light on the pathogenesis of the sterile dyshidrotic and scaling conditions of the hands which so often accompany epidermophytosis of the feet, at least so far as our material was concerned. The conception of the manifestations on the hands as epidermophytids (Williams, Bloch) was first supported by Walthard's [4] publication of the details of a clear case from the Bloch clinic and by the investigations of Jadassohn and Peck [10] on twenty-four patients. Especially the last named work strengthened this conception and established it on a much broader and firmer basis.

The investigations reported here, while they have added to knowledge of the clinic (twenty-three new cases), to pathology and to mycology, owe their importance most of all to the experimental proofs which were brought forward to establish the truth of the epidermophytid theory.

There is no doubt about the etiologic rôle of *Epidermophyton* in the conditions of the feet that have been described in this article.

The isolation of *Epidermophyton* Kaufmann-Wolf from sixteen of the cases reported here, as well as from seventeen of the cases reported by Jadassohn and Peck,[10] showed that in Switzerland (Zurich), just as

in Germany, North America and Austria,[27] this organism is the most frequent causative agent in mycotic infections of the feet. That it is a true pathogen and not merely a saprophyte was seen from the reproduction of mycosis of the feet by von Graffenried [3] and myself with this fungus.

Allergy.—In the papers of Walthard,[4] and Jadassohn and Peck,[10] while the clinical data (secondary appearance of the lesions on the hands, therapeutic results, etc.) supported the conception of the conditions of the hands as epidermophytids, the greatest stress—and rightly so—was laid on the demonstration of a state of allergy, since for the acceptance of an eruption as an "id" the presence of such a specific state is a conditio sine qua non.

In spite of the apparent superficiality of the lesions caused by *Epidermophyton* Kaufmann-Wolf, it has a special tendency to bring about an allergic state in the infected organism. This is seen from the positive trichophytin reaction in all of the cases from which it was isolated and in the experimental epidermophytoses produced by von-Graffenried [3] and myself—in the experiment reported here, as quickly as fourteen days after infection. This fact, together with the rather frequent observation of the Kaufmann-Wolf fungus as the etiologic agent, perhaps explains the frequency with which mycoses of the feet are accompanied by epidermophytids.

The results of the studies of this phenomenon in the cases here reported are fully in accord with what is known in other "id" eruptions; and are an important confirmation of the conception of the lesions on the hands as epidermophytids.

After intracutaneous injection of trichophytin there was a positive local reaction in all of the cases; in many there was also a focal and a general reaction which was expressed by reactions in the primary lesions and herd reactions in the epidermophytids on the hands, such as provocation of dyshidrotic eruptions and reactivation of almost disappearing ones, as well as rises in temperature and lymphatic enlargement.

The question of reinoculation is also of importance in the study of the allergy of a disease. This is of special interest in the cases of mycosis of the feet because of the number of recurrences which are seen. We know from the experiments of Bloch [17] that deep trichophyton infections which lead to a high degree of allergy may render the allergic subject refractory to a second infection. However, as later experiments of Bloch and others have shown, this condition of immunity

27. For a complete discussion of the different fungi which were cultured from the dyshidrotic mycosis, see Miescher: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1928, vol. 11, pp. 469-472.

does not always take place in spite of a fairly high degree of allergy.[28] The degree of immunity is apparently—among other conditions—dependent on the strain of fungus. The reinfection, while it may succeed (Bloch,[17] Saeves,[29] Guth [30] and others), has a shorter incubation period and a shorter course, reaches its acme sooner and shows a greater inflammatory component. In the reinoculation experiments of Bloch [17] and his co-workers, however, one is dealing with a set of conditions somewhat different from those one has here, because in their experiments one had a deep trichophyton, i. e., *Achorion* infection, while in those reported here one has a superficial epidermophytosis, the fungi propagating in the keratin layers.

While mycosis of the feet experimentally produced did not render the test subject immune to a subsequent infection, the reinfection showed a more marked inflammatory component than the primary one; it reached its peak sooner—ten days as compared with the twenty-four days of the first infection—and it showed a more widespread area of reaction. Unfortunately, treatment for the lesions on the feet had to be begun, so that it was not possible to determine whether the course of the reinfection was shorter. Although fungi could be demonstrated in the lesions on the feet in experiment 2, they were harder to find than in experiment 1. It may be seen, therefore, that in spite of the absence of immunity the course of the reinfection was modified by the first inoculation, i. e., by the allergic state which it produced. In the same sense one can interpret the fact of central healing and peripheral extension.

The success of the reinoculation seems understandable when one considers that the fungi propagate in the dead keratin layers of the epidermis in which contact with the living allergic tissue does not take place. Only when the fungi are brought into contact with the living tissues, by their attempt to penetrate into them either by growth or mechanically, do the allergic forces come into play.

Culture of the Epidermophyton from the Circulating Blood.—Theoretically, the epidermophytids, just as in the case of the trichophytids, could be caused by hematogenously transported toxins as well as by fungi—mycelia and spores. It is known from the experiments of Bloch [17] that intravenous trichophyton injections into an allergic patient give rise to lesions which are not to be differentiated from lichen

28. Weidman (Laboratory Aspects of Epidermophytosis, Arch. Dermat. & Syph. **15**:415 [April] 1927) was able to reinfect the site of the first experimental infection on his own feet two years later with Epidermophyton cruris, but he did not test himself to see whether an allergic state was produced by his primary infection.

29. Saeves, I.: Arch. f. Dermat. u. Syph. **129**:161, 1916.

30. Guth, quoted by Bloch (footnote 2, first reference, p. 333).

trichophyticus. Nevertheless, it is certain that cultural proof of living fungi in the circulating blood—as was first given by Jessner and Ambrisoli and later substantiated by other authors (Bloch [31])—had a much more important significance and was a much stronger argument in the explanation of the pathogenesis of the trichophytids. Such a proof was much needed to support the contention that the lesions on the hands are epidermophytids.

With the positive blood culture for fungi reported in this paper, this most important proof for the conception of the pathologic changes on the hands as epidermophytids has been established, and it has been shown that—as in the case of the trichophytids—the manifestations on the hands are due to a hematogenous transport of living fungi. Although until now it has been successful in only one case, it has been agreed by investigators that positive observations under such conditions always take precedence over negative ones. The positive cultures from one of the vesicles on the hands also speak for the fungus theory.

Experimental Reproduction of the Whole Disease Syndrome.—More important than the successful blood culture was the experimental reproduction of the complete disease syndrome—epidermophytosis and epidermophytid—for the proof of the pathogenesis. This is the first case in which a "mycid" has been produced in a previously well person.

Thirteen days after the first experimental infection with *Epidermophyton* Kaufmann-Wolf, the trichophytin reaction became positive, and about a week later, when the lesions on the feet had already reached their acme, a few vesicles of a dyshidrotic type appeared on the hands. They appeared in crops during the next two weeks and finally disappeared without visible desquamation. This first epidermophytid was slight.

In the second experiment, however, I obtained a typical eruption of dyshidrotic epidermophytids on the hands two weeks after the reinoculation. The changes on the feet here also had already reached their peak. The epidermophytids were present for eight days, new ones appearing in a series of crops, and then they disappeared with desquamation. The eruption on the hands in the second experiment was much more striking than that in the first experiment; there was a greater number of vesicles; the vesicles reached a greater size, and at its height the changes were not to be differentiated from the clinical cases.

Just as has been observed in the spontaneous trichophytids, the epidermophytids in these experiments appeared after the lesions on the feet had reached their high point and were subsiding. The experimentally

31. Bloch (footnote 2, first reference, p. 600).

produced mycosis of the feet with its dyshidrotic epidermophytid on the hands simulated in every particular the clinical cases: On the feet, one had the picture of the intertriginous, vesiculopustular mycosis which was microscopically and culturally positive for fungi; on the hands, one had a typical dyshidrotic eruption which was microscopically and culturally negative for fungi; the trichophytin reaction was strongly positive.

The mechanical factor of pressure and rubbing certainly plays an important rôle on the feet in forcing the fungus elements into more intimate contact with the deeper layers of the epidermis and possibly forcing them into the blood stream itself. Epidermophytids, as all mycids, often appeared on the hands after walking tours or chemical trauma (treatment) of the lesions on the feet, or after trichophytin and roentgen treatment of the primary lesions.

Without a doubt, the pathogenesis of the epidermophytids localized on the hands has to a great extent been cleared up by the investigations and experiments here reported.

Before I summarize my observations, I should like to discuss several points which seem to me to need further explanation.

LOCALIZATION

The investigations do not explain the special localization of the epidermophytids which are found almost without exception on the hands. They are seldom found on the feet or without any special rule, having a general distribution. It is not known whether temperature or circulatory conditions or some anatomic factor, such as thickness of the horny layer (?), or chemical affinity may play a rôle. It should be pointed out that even the localization of the exogenous epidermomycoses has as yet not been adequately explained: why the same organism one time causes a disease in the inguinal region, eczema marginatum, and another time, a disease on the feet, mycosis.

MECHANISM OF THE LOCAL CHANGES OF THE EPIDERMOPHYTIDS

A certain difficulty is encountered when one attempts to explain the mechanism of the local changes of the epidermophytids.

It is seen especially from the histologic studies that these changes differ scarcely at all qualitatively from those on the feet; at the most, only quantitatively. As in all epidermal, nonfollicular trichophyton infections, the causative organism of the lesions on the feet is found almost exclusively in the horny layers, never in the living epidermis. In order to explain the pathologic changes in the epidermis and cutis, one must assume that products of the metabolism or the degeneration of the fungi situated in the horny layers are absorbed and that these absorbed substances call forth an inflammatory reaction in the epidermis

and blood vessels. Fungi directly invading the living epidermis may sometimes play a rôle in the histologic changes; they were actually seen in one section directly invading the living tissues (see under Primary Mycosis of the Feet, fourth paragraph); conditions for growth not being suitable, they degenerate and are absorbed, and these absorption products cause changes in the underlying papillae.

It is more difficult, however, to use the same mechanism to explain the analogous changes of the epidermophytids, even though the rare finding of a few fungous elements—as in one of my cases—in analogy to that used in the explanation of the trichophytids, could be used to explain matters. It is probable that usually the hematogenously transported fungous elements are destroyed by the allergic forces when they leave the papillary body or in the papilla itself, so that they do not reach the horny layers, and thus substances are set free which are able to produce toxic inflammatory effects. Analogous mechanisms are seen in certain eczemas which are called forth by direct application, as well as by hematogenous transport, of eczematogenous substances.

RELATION BETWEEN THE EPIDERMOPHYTIDS, TRUE DYSHIDROSIS AND ECZEMA

The relationship of the epidermophytids to dyshidrosis (Tilbury Fox) or cheiropompholyx (Hutchinson), as well as to eczema, has a practical as well as a theoretical interest.

For a long time, there has been no doubt in the minds of most authors that the clinical picture described by Fox and Hutchinson represents a symptom complex, "reaction cutanée," rather than a disease entity. Whether within that group there are cases due to functional anomalies of the sweat glands (true dyshidrosis) I am unable to say because of the lack of personal investigations—especially histologic studies—in such cases.

Only a few authors still maintain that there is a true dyshidrosis characterized histologically by pathologic changes in the intra-epidermal part of the sweat duct (Sabouraud, Sicoli,[11] Rajka [7] and Nestorjewsky).[32] In their most recent studies of what they believed to be true dyshidrosis, Alexander [21] and Gans [22] failed to find any connection between the changes in the sweat ducts and vesicle formation. During the past two years, when I was paying special attention to dyshidrotic, i. e., vesicular, manifestations on the hands, the great majority of them turned out to be either epidermophytids or eczemas; only a few cases were seen which could not be classified under these two groups and perhaps belonged to the group of true dyshidrosis.

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32. Nestorjewsky, W. A.: Dermat. Ztschr. **13**:183 and 357, 1906.

It is certain that in the dyshidrotic symptom complex—leaving the question of the true "dyshidrosis" aside—at least two dermatoses must be differentiated: eczema with a manifold etiology and a parasitic group (Darière, Alexander, Weidman, Williams, Walthard and others—discussed in detail by Miescher [33]). In the last group, as was seen from the present investigations, *Epidermophyton* plays an unexpectedly important rôle and one which until now surely has not been appreciated enough.

It is, however, possible that in other cases, perhaps in other countries, other parasites, also bacteria, can cause the same clinical picture, exogenously and hematogenously.

The close resemblance between the epidermophyton involvements of the hands and feet and the eczemas that are localized on the same areas is striking, and it is the reason why it is a relatively short time (Djelaleddin Moukhar, 1892; Sabouraud, 1910) since the parasitic nature of these epidermophytoses has been recognized. While there exist at least certain clinical differences (tendency to grouping, central healing, pustule formation—see Miescher [33]), histologically, aside from the presence of fungi, there are hardly any differences present. The resemblance is still greater so far as the epidermophytids are concerned, especially those on the hands.

Here, the clinical and especially the histologic picture is identical with that of "dyshidrotic" eczema, so that a histologic preparation (figs. 6 and 7) could just as well be diagnosed as eczema; all of the characteristics of eczema—spongiosis, vesicle formation, parakeratosis, inflammatory processes, etc., are present. The true pathogenesis of these cases is only, then, to be discovered when they are analyzed along the lines followed in this paper.

Theoretically, one could maintain, with a certain amount of justification, that the dyshidrotic and squamous epidermophytids represent nothing more than an etiologically and pathogenically explained special group of that great symptom complex which is still called eczema. This group differs from an endogenous, allergic eczema, such as that caused by foods or medicaments, only through the special constitution and origin of the allergen (fungus), not however, in the (allergic) pathogenesis and still less in its clinical and histologic manifestations.

Similarly, Ravaut,[34] in a recent paper, has proposed the interesting theory that from a localized lesion of the skin due to yeasts there may be caused hematogenous "levuride," which clinically corresponds to what has been called "eczematoid," seborrheic and parakeratotic eczema.

33. Miescher (footnote 9, p. 478).
34. Ravaut: Presse méd. **2**:1443, 1928.

These studies have been of great practical importance to my associates and myself in the treatment of patients with skin diseases of the hands, because they have demonstrated the value of examining every patient with a dyshidrotic, squamous or even eczematoid eruption on the hands for possible mycosis of the feet. Many of the patients in our series did not know that they had any disease of the feet, and some of the lesions there were so slight that they surely would have been overlooked prior to our work on this subject. A number of patients whom we had been treating for a long time for recurrent eczema of the hands, with poor therapeutic results, were healed only when the correct diagnosis was made and the primary mycotic lesions of the feet were treated.

SUMMARY

Twenty-three new cases of epidermophytosis of the feet, in which at the same time dyshidrotic or squamous changes were present on the hands, were studied. The following clinical observations, which were like those in the cases reported by Jadassohn and Peck,[10] forty-seven cases in all, supported the conception of the pathologic manifestations on the hands as epidermophytids secondary to the primary lesions of the feet:

1. The lesions of the hands in those cases in which the patient was aware that he had mycosis of the feet appeared after the foot infection had been present for some time; in some of the cases, typical dyshidrotic eruptions appeared on the hands after mechanical or chemical trauma (treatment) of the lesions of the feet or after a trichophyton reaction.

2. After intracutaneous injection of trichophytin, in each case, there occurred a positive local reaction demonstrating a state of allergy; in a number of the cases reactions were also shown in the primary lesions and herd reactions in the lesions on the hands, as well as rises in temperature, general malaise and lymphatic enlargement.

3. In analogy to other "id" eruptions, with the exception of one case (one culture tube for the hands in comparison with six for the feet), the lesions of the hands were microscopically and culturally negative for fungi, while the lesions of the feet were all microscopically positive for fungi, and from fifteen of the cases *Epidermophyton* Kaufmann-Wolf was cultured.

4. Generally, the lesions of the hands healed only when the primary mycosis of the feet was treated.

5. In one case, the dyshidrotic changes on the hands were accompanied by a generalized eruption of the same character.

Clinical Manifestations.—There were two types of clinical manifestations on the hands (with transitions): (1) a dyshidrotic-eczematoid,

i. e., vesicular, form, and (2) a squamous type that was usually an end-stage of the vesicular type, but could also appear primarily. The squamous epidermophytids sometimes resembled postscarlatiniform desquamation.

A primary epidermophytosis of one hand was reported—which was also caused by *Epidermophyton* Kaufmann-Wolf—with a positive trichophytin reaction and a dyshidrotic epidermophytid on the other hand and on one foot.

Histology.—Histologically, the primary mycotic lesions of the feet were characterized by vesicle formation in the prickle cell layer. The fungi were found in the keratin layers, but in one section they were seen to penetrate into the vesicle itself.

The dyshidrotic epidermophytids differed from the primary lesions of the feet only in the absence of fungi; in both, there was no relation between vesicle formation and changes in the sweat ducts.

The primary squamous epidermophytids were characterized by abortive vesicle formation in the lower layers of the epidermis, spongiosis and leukocytic infiltration of the area of spongiosis, and subcorneal vesicles which remained microscopic in size.

The resemblance of the epidermophytids to eczema was even more striking histologically than clinically. *Epidermophyton* and perhaps other parasites play a much greater rôle in the pathogenesis of eczema than has hitherto been suspected.

In one of the cases, it was possible to culture *Epidermophyton* not only from the lesions of the feet but also in analogy to the observations in the case of the trichophytids—from the circulating blood.

Experimental Reproduction of the Disease Syndrome.—It was possible to reproduce experimentally the complete disease syndrome—epidermophytosis and epidermophytid.

A mycotic infection of the feet was produced with *Epidermophyton* Kaufmann-Wolf in a previously well, trichophytin-negative person; the same fungus could be reisolated from the disease produced. Thirteen days after the beginning of the experiment, the trichophytin reaction became positive; twenty-four days after the beginning of the experiment, a slight dyshidrotic eruption developed on the hands. The lesions of the hands were negative for fungi.

A reinfection was produced on the feet of the same patient with the reisolated *Epidermophyton* Kaufmann-Wolf after spontaneous healing of the first infection had occurred. The second experimental mycosis of the feet was followed in two weeks by a typical dyshidrotic epidermophytid on the hands. Histologically, it was the same as the dyshidrotic epidermophytids in the clinical cases. The lesions on the hands were microscopically and culturally negative for fungi, while

those on the feet were microscopically and culturally positive for fungi. The trichophytin reaction was strongly positive at the end of the experiment.

This is the first time that a "mycid" has been produced in a previously well human being.

Cultural Studies.—Four varieties of *Epidermophyton* Kaufmann-Wolf were cultivated: (1) a type resembling *Achorion quinckeanum;* (2) a *Trichophyton gypseum* type; (3) a cerebriform type, and (4) a coarsely red granular form which has previously not been described.

CONCLUSIONS

Clinical and, above all, experimental evidence has shown that the vesicular and squamous changes on the hands which accompany so many of the cases of epidermophytosis of the feet are epidermophytids secondary to the hematogenous transport of living fungi from the primary lesions of the feet.

NOTE.—Since submitting my manuscript for publication, I have had the opportunity of reading Cleveland White's paper (Autoinoculation Dermatophytosis From Toe Cultures of Human Volunteers, ARCH. DERMAT. & SYPH. **20:** 314 [Sept.] 1929) in which he reports autoinoculation of areas on the back and in the axilla with fungi isolated from the mycotic lesions on the feet. He identified the organisms as *Trichophyton gypseum* and *Trichophyton interdigitale* (this last is identical with the *Epidermophyton* Kaufmann-Wolf). The patients were not tested with trichophytin to determine whether an allergic state was produced by the mycoses of the feet.

TREATMENT OF LUPUS ERYTHEMATOSUS BY INTRAVENOUS INJECTIONS OF GOLD CHLORIDE *

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In two previous papers [1] I reported the preliminary results I had obtained in the treatment of patients with lupus erythematosus by intravenous injections of gold chloride in small doses. These first experiments were carried out in the dermatologic department of the Rigshospital. I have now had an opportunity of continuing the experiments in the Finsen Institute where the large number of cases of lupus erythematosus has made it possible for me within two years to try out gold chloride therapy in more than one hundred cases.

The idea of employing gold chloride in cases of lupus erythematosus originated in a survey of the results obtained in treating patients for this lesion with other gold compounds. The first step in this direction, I think, was taken by Ruete,[2] who experimented with intravenous injections of potassium gold cyanide and obtained some encouraging results. Later, as is well known, a number of other gold compounds, such as sodium aurothiosulphate and 4-amino-2-auro-thiophenol carbonic acid, as well as some preparations of unknown composition, were used in the treatment for lupus erythematosus. It would lead too far to discuss the details of the many reports that are made on the effect of these remedies. A more detailed review with extensive references is given by Martenstein,[3] Debarge,[4] and Schamberg and Wright.[5] The following is an aggregate impression of the results: On administration of all the various gold compounds, some of the patients were cured, and a larger number were considerably improved, whereas but a few cases appear to be completely refractory. Relapses seemed to be rare, so far as one might draw any conclusions from the observation periods, which

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1. Haxthausen, H.: Behandling af Lupus erythematosus med guldklorid, Dansk derm. Selsk. Forh., Feb. 2, 1927; Treatment of Lupus Erythematosus with Intravenous Injections of Gold-Chloride, Nord. derm. Fören. Förh., May 29, 1928.

2. Ruete: Deutsche med. Wchnschr., 1913, p. 1727.

3. Martenstein, Derm. Ztschr. **47**:309, 1926.

4. Debarge: Thèse de Lausanne, 1925.

5. Schamberg and Wright: Use of Gold and Sodium Thiosulphate in Treatment of Lupus Erythematosus, Arch. Dermat. & Syph. **15**:119 (Feb.) 1927.

were generally all too short. On the other hand, there were various annoying incidental effects in the form of veritable metallic poisonings, with stomatitis, nephritis, enteritis and exanthems; in the form of an exacerbation of the lesion often associated with fever, or in the form of acute attacks that reminded one of anaphylactic shock. Death occurred after the injection of 1 mg. of a gold compound in a case reported by Bruhns.[6]

To begin with, the gold compounds were given in rather large doses. When the incidental effects mentioned were noticed, the doses were decreased, and it was found that the therapeutic results were not less favorable, but rather better than before. Feldt [7] was the first to emphasize the good effect of very small doses, and in most of the subsequent articles the authors have arrived at the same conclusion. The tendency has therefore been toward the small doses, which often amount to mere fractions of 1 mg. of gold. Most clinicians, however, have adopted the method of gradually increasing the dose, till it is ten or twenty times as large as the initial dose, usually with an interval of one or two weeks between the injections.

IS THE GOLD EFFECT A "METAL SALT EFFFECT"?

The facts that minimal doses of various gold preparations cause a rather uniform therapeutic effect and that small doses sometimes produce better effects than larger ones—even though the latter agree with the patient—suggest that the gold component itself is the decisive factor and direct the thought to the peculiar so-called metal salt effects, to which the noted and interesting experiments by Walbum [8] have called attention.

Walbum showed that various metal salts in very small doses are able to influence various biologic processes in the diseased and the healthy organisms. The best known of these metal salt actions, I think, is the effect on the production of diphtheria antitoxin, which is stimulated to a considerable extent by manganochloride. But one may further mention that small doses of cesium and iridium salts are able to prevent the fatal course of ratin infection in mice, and that various other metal salts, employed in a similar way, appear to have a certain curative effect in experimental animal tuberculosis, while other metal salts have proved to be effective, for instance, in staphylococcus infections.

The outstanding points in Walbum's investigations are the demonstration of a certain specific effect of particular metal salts in various processes and the great importance attached to the correctness of the

6. Bruhns: Zentralbl. f. Haut- u. Geschlechtskrankh. **13**:326, 1924.
7. Feldt: Deutsche med. Wchnschr. **50**:873, 1924.
8. Walbum: Ztschr. f. Immunitätsforsch. u. exper. Therap. **47**:213, 1926.

dosage. As distinct from the real chemotherapy, in which the best effect is probably obtained with the largest doses that may be given without injury to the organism, the effect of the metal salt therapy is associated with a definite optimal dose. If the optimal dose is lowered comparatively little, the effect fails to materialize, and, as is particularly interesting, the same happens when the dose is increased, even though the larger dose is far below the toxic limit. The size of the optimal dose varies according to the nature of the metal salt, its particular purpose and, apparently, also individual differences.

If the similarity between the observations in the gold treatment for lupus erythematosus and in the Walbum "metal salt therapy" signifies that in this treatment one is really dealing with a "metal salt effect," then it would be expected that simple inorganic gold salts would also prove effective when given in suitable doses. It would even be reasonable to assume that such salts were more effective than the complicated organic gold compounds, as in other fields the ordinary simple salts have a more pronounced metal salt effect than have the complex compounds.

USE OF GOLD CHLORIDE ACCORDING TO THE WALBUM PRINCIPLES

In 1926, on the basis of the views stated, I started my experiments on the treatment for lupus erythematosus with gold chloride in very small intravenous doses; they soon proved to have an unquestionable therapeutic effect. I began the treatment of a patient with the injection of 1 cc. of a 0.1 per cent solution of gold chloride once a week. If the eruption showed some improvement after this treatment, the same dosage was kept up as long as the improvement continued. If, on the other hand, no change in the eruption could be made out after from four to six injections of this dose (each injection representing 1 mg. of gold chloride), the dose was increased to 5 cc. of the same solution, that is, 5 mg. of gold chloride once a week. If improvement occurred, this dose was continued in subsequent injections; if improvement failed to occur after six injections of 5 mg., the dosage was increased to 10 mg. once a week. Except for one case in which I tried a dose of 20 mg., I have never exceeded 10 mg. once a week. During the first two years I did not give more than twenty injections in succession; therafter I interposed an interval of one or two months, for fear of eventual, late occurring, toxic effects. I have never noticed any such effects, however, and recently I have been giving the injections in longer series.

The purpose of this procedure, which is a departure from the usual principle of gradually increasing the dose, has been as far as possible to find the "optimal" dose, if any exists in this treatment, and to continue to use this dose in the subsequent treatment, as I think one might reasonably be apprehensive of missing the therapeutic effect when the dose is increased week by week. Apart from this fundamental principle,

the individual phases in this treatment, the size of dose, the intervals, etc., are chosen rather arbitrarily. But I have thought it expedient to follow this plan in a larger number of cases in order to obtain material by which I might be able to judge the value of eventual changes in the dosage.

RESULTS

Besides the first ten cases reported, which I was not able to follow up further and which I therefore have excluded from this acount, the gold chloride treatment was tried out in 109 cases of lupus erythematosus. One case, which will be mentioned separately, belonged to the subacute disseminated form; all the others represented the discoid form, including acute as well as more chronic forms. Before treatment with gold compounds, the majority of these patients had been treated with other remedies, particularly with carbon dioxide snow and Finsen light. About three-fourths of the patients were women.

Treatment for Lupus Erythematosus with Gold Chloride

	Total No. of Cases	Apparent Cure	Improvement	Improvement, but a Later Relapse	Not Affected	Aggravated
Gold chloride alone.....	37	12	10	7	7	1
Gold chloride and Finsen light...	35	12	18	1	3	1

	1 Mg.	5 Mg.	10 Mg.
Distribution of 12 cases of apparent cure after straight treatment with gold chloride, according to dose.....	6	5	1

Among the patients who have been treated exclusively with gold chloride, thirty-seven have been under regular observation for at least one-half year; thirty-five patients were treated at the same time with gold chloride and with light rays in the form of Finsen radiation for periods of from fifteen to sixty minutes each; they were likewise observed for one-half year at least; thirty-five patients either were treated in a manner differing from the plan of therapy mentioned, or were not under observation sufficiently long. These cases will be discussed separately, as will the cases of two patients who died after the treatment.

The results of the treatment in the first two groups are evident from the table. Here the result of the combined therapy was better than the result of gold treatment alone. The difference was even more pronounced than is evident from the figures, as some patients whose condition had proved refractory to gold treatment alone had been placed on combined treatment, and in some protracted and torpid cases the patients were at once subjected to the combined treatment.

Greatest interest is attached to the case in which gold preparations only were given, as they give the clearest indications of the efficacy of this treatment. On the whole, the results here are in keeping with those obtained by the administration of complex gold compounds and thus corroborate the hypothesis that the gold component is the decisive

Fig. 1.—*Upper:* Lupus erythematosus of the left cheek; duration, several months. No previous treatment had been given. Four weekly injections of 1 mg. of gold chloride, had no effect; then two weekly injections of 5 mg. were followed by apparent recovery. *Lower:* Lupus erythematous of the right cheek and nose; duration, one and one-half years. No previous treatment had been given. Eight weekly injections of 1 mg. of gold chloride produced considerable improvement as shown in *B*. Later the eruption disappeared completely without further treatment (statement by family physician).

factor in this treatment. Whether gold chloride is more effective than the complex compounds, and whether there are any essential therapeutic differences between these preparations, cannot be decided for the present. In should be stated, however, that the cases which had proved refractory to gold chloride did not respond to other gold compounds (amino-aurothiophenol carbonic acid and sodium aurothiosulphate) when these were tried.

Fig. 2.—*Upper:* Lupus erythematosus of the left cheek and nose; duration six years. Previous treatment with carbonic acid had been ineffective. Eight weekly injections of 1 mg. of gold chloride produced some improvement. Apparent recovery took place after eight additional weekly injections of 5 mg. *Lower:* Lupus erythematosus of the nose; duration, one year; previous treatment with light and thorium had been ineffective. Fourteen weekly injections of 1 mg. of gold chloride produced considerable improvement. Complete disappearance of the eruption took place after four additional injections of 5 mg.

A survey of the twelve cases in which the patient was "cured" after straight treatment with gold chloride shows that in six cases the cure was attained with the smallest dosage: 1 mg. once a week. In five cases, the eruption was first decisively affected by a dose of 5 mg., after which it was cured with successive injections of this amount. In only one of the cured cases did the effect first appear after a dose of 10 mg. In the great majority of the cured cases, therefore, the favorable effect is obtained with the smallest and next smallest doses. The same conclusion is also arrived at in reviewing the cases in which there is improvement. Most of these patients improve on the administration of 1 or 5 mg.; then the condition becomes stationary, after which improvement is secured in only a few instances by an increase in the dose.

Fig. 3.—Lupus erythematosus of the back of both hands and of the fingers; duration, seven years. Previous treatment with ointments had been ineffective. Four weekly injections of 1 mg. of gold chloride were without effect. Then six weekly injections of 5 mg. were followed by apparent recovery.

There is a great variation in the number of injections required to make the eruption disappear. The quickest recovery is observed after three injections of 1 mg.; there are all kinds of transitions from this record to the cases that were the slowest in their response and in which treatment had to be given for several months.

No definite relation between the clinical type of the lesion and the effective dosage has been found. Still, it appears as if recovery after the administration of the smallest dosage occurs chiefly in the acute and slightly infiltrated forms of the disease, whereas the torpid and infiltrated chronic cases are first affected by the next smallest dose. This is also in keeping with the observations that Martenstein made with complex gold compounds. On the whole, the comparatively recent cases appear to yield the best results. There is no difference in the

effect on men and on women, nor does the localization of the eruption seem to influence the therapeutic effect of the dose.

As to the treatment with gold chloride and Finsen light, this appears to be a favorable combination. The majority of the patients who have

Fig. 4.—*Upper:* Lupus erythematosus of the right cheek and nose; duration, one year. No previous treatment had been given. Four weekly injections of 1 mg. of gold chloride produced no effect. Then five injections of 5 mg. produced some improvement as shown in figure *B*. The dose was now increased to 10 mg., after which there was an extensive relapse, refractory to further treatment (also in small doses). *Lower:* Lupus erythematosus of both cheeks; duration, two years. Previous treatment with carbonic acid and Finsen light was ineffective, as were six weekly injections of 1 mg. of gold chloride. Subsequently seven injections of 5 mg. were given, also without effect. Then thirty injections of 10 mg. were given, resulting in the complete disappearance of the eruption. The lesion on the upper lip in figure *B* is a herpes.

undergone this treatment have previously been treated in vain with the Finsen light for years; as mentioned before, this material comprises also some cases that have proved refractory to gold alone. The fact that approximately 35 per cent of these patients have been "cured" while approximately 50 per cent have improved considerably may be taken to indicate that the combined treatment with gold and light is considerably more effective than each method of treatment by itself. It is of decisive importance that the light is employed in a concentrated form, as diffuse light—for instance, sunlight, "Alpine sun" and nonconcentrated arc-light—often has an aggravating influence on lupus erythematosus and frequently produces this lesion. So these sources of light the therapeutic effect of which is altogether problematic for this condition should not be employed. In only one instance have I observed any such unfavorable effect after treatment with Finsen light, the action of which, as is well known, is entirely different from that of the aforementioned sources of light. Two cases that are not included in the material, and in which the gold chloride was combined with carbonic acid freezing, also showed a favorable course, so that perhaps this combination, too, may be employed with success. In the case of complex gold compounds, the advantage of such combined treatment has been pointed out by several authors, among others, Hedén.[9]

RELAPSES

Among the thirty-seven patients treated exclusively with gold chloride, seven had relapses; i. e., the treatment first brought about apparent recovery or improvement, after which relapses occurred frequently in the form of an exacerbation of the old efflorescences, but sometimes in the form of new ones. This group comprises both more acute and more chronic cases; the relapses sometimes occurred shortly after the discontinuance of treatment and sometimes during the treatment. In the first group I have always repeated the treatment first with the dose that was effective before, but usually the result has been negative. When there have been relapses during treatment, I have raised or lowered the dose; but in these cases, too, the therapeutic result has usually been negative. When relapses occur after treatment with a gold compound there appears to be marked resistance to further treatment.

INCIDENTAL EFFECTS

As already mentioned, treatment with complex gold compounds has frequently been associated with annoying and even serious incidental effects. These seem still to occur rather often, although greater caution is used in the dosage. In this respect, however, the gold chloride is

9. Hedén: Nord. derm. Kongres, Oslo, 1928.

particularly expedient. Now and then I have observed a slight rise of temperature after an injection; but, as a rule, this is not connected with any demonstrable change in the general condition. In two cases an urticarial exanthem appeared the day after the first and the third injection, respectively, and was accompanied by a slight fever. This exanthem and the fever subsided rapidly in both cases; subsequent

Fig. 5.—*Upper:* Lupus erythematosus of the nose; duration, three years; previous treatment with carbonic acid of no effect. Eruption disappeared on combined treatment, with Finsen light and gold chloride, after seven weekly injections of 1 mg., plus four injections of 5 mg. *Lower:* Lupus erythematosus of the nose and of both cheeks; duration, fifteen years. *A* shows the condition prior to Finsen treatment, which was given alone for two years, without any improvement worth mentioning. *B* shows the condition after combined treatment with Finsen light and gold chloride. Considerable improvement occurred after nine monthly injections of 5 mg.

injections gave no discomfort. It is interesting that in both cases the improvement began immediately after this systemic reaction, and both patients were cured in a very short time. In a third case, the treatment was accompanied by an exanthem that in its appearance and course was exactly like pityriasis rosea, and was most likely an accidental complication. In a fourth case there was marked aggravation of a preexisting eczematized pityriasis simplex; this is perhaps attributable to the compound effect of the gold, as the lesion may be aggravated in a similar manner by substances like arsenic, for instance. Two cases showed transitory albuminuria, and one case transitory glycosuria.

No dangerous or even alarming incidental effects were seen after the many hundreds of injections that were given. The gold chloride therefore seems to be considerably more advantageous than the complex gold compounds with regard to the incidental effects. This can hardly be a consequence only of the amount of gold injected, for in treatment with amino-auro-thiophenol carbonic acid, for instance, serious effects have been observed after doses that contain less gold than do the doses in this group. Most likely, the complex compounds produce some conditions of hypersensitiveness more readily than does the simple inorganic salt.

Two of the patients treated have died. One of these drowned, so there is no reason to discuss this case. The other was the only patient case with subacute disseminated lupus erythematosus who had been treated with gold chloride. She reacted exceedingly favorably to the dose of 1 mg. once a week, which was tolerated without discomfort. The eruption had almost disappeared after only seven injections. After an interval of two months during which treatment was discontinued the patient had a relapse; an eruption similar to the original one occurred; it disappeared promptly after a few weekly injections of 1 mg. of gold chloride. Three months later, however, an acute disseminated eruption appeared, accompanied by fever and marked debility. In spite of the previous favorable results, further treatment with gold chloride was discontinued on account of the serious general condition. The patient died a few weeks later from a complicating bronchopneumonia. This fatality can hardly be attributed to the treatment, as it does not seem likely that the earlier, apparently favorable, effect from the few injections of gold chloride could have any part in the acute relapse several months later. Perhaps the same treatment should have been used during the last relapse.

THE DOSAGE

The method which in the main has been followed in all the cases mentioned is contrary to the usual principle of gradually increasing the dose. The aim has been to find as far as possible the effective dose

for the individual case, and then to continue with this dose. The method therefore rests on the hypothesis that there is an optimal dose, and that this is somewhat constant during the course of treatment. Of course, one is not certain of this fact. From the results obtained, one cannot conclude off-hand that the action of the gold compounds is dependent on a certain concentration; for it is possible that the patients who are "cured" by means of injections of 1 mg. would also have been cured if the dose had been 5 or 10 mg. from the start. Only this conclusion may be drawn: Very small amounts of gold may be effective. Even though there be an optimal dose, I think that one should allow for the possibility that it may change, perhaps, in the course of treatment. Therefore, it is by no means a foregone conclusion that the dose which has an immediate favorable effect should be continued throughout the treatment as the most suitable dose. Finally, it is also possible that other intervals might prove more favorable than the arbitrary interval of one week. In the thirty-five cases that are not included in the therapeutic results of the table, I have made several variations in the dosage to obtain a clear understanding, if possible, of the best method. In some of these cases, I have started with doses larger or smaller than 1 mg.; in some I have employed a successive increase of the dose; in some I have varied the intervals between the injections from one day to one month; and, finally, I have treated some patients with 1 mg. every week for a very long time without increasing the dose, even though the eruption was not affected after the first six injections.

Obviously, the resulting "groups" of cases with different treatment are too small for any real comparison with the chief method; still, they offer some suggestions that may be worth mentioning. One patient was first treated with 5 mg. a week without any result, and then with 10 mg. weekly, still without effect; after about two months, treatment was reinstituted with 1 mg. a week, and this small dose resulted in considerable improvement.

In two cases, the dose was gradually increased, week by week, to 10 mg., with but slight improvement. Later, these two patients improved markedly on combined treatment with gold chloride and Finsen light.

Strikingly little improvement was noticed in the cases in which the interval was less than one week, whereas good results have been observed on treatment with 1 and 5 mg. and with 10 mg. every two weeks. One patient who was treated with 10 mg. once a month did not show any effect. Considerable improvement, however, was observed in an analogous case in which 5 mg. of gold chloride was given once a month and, at the same time, Finsen light was used. This case had previously been rather refractory to light therapy alone. Finally, I have seen improvement after treatment for a long time in two cases when the dose of

1 mg. a week was continued, although no effect could be noted after the first six injections.

The impressions conveyed by these scattered experiments with dosage are: first, the lack of parallelism between the therapeutic result and the amount of the gold compound injected and, second, the importance of a suitable, not too short, interval between the injections. Both circumstances suggest that one is dealing with an indirect effect that shows an evident resemblance to the Walbum metal salt effects. These experiments have not revealed any reason for discontinuing the original dosage and adopting another; they will be continued in an endeavor to find eventually some more effective method. In future work I shall primarily try some doses of less than 1 mg. and doses between 1 and 5 mg., in view of the fact that the majority of the good results are obtained with one of these doses. I shall also make a trial of intramuscular injections of gold salts which are dissolved with difficulty.

Unfortunately, so far I have not been able to determine any characteristic reaction of the organism as, for instance, a typical rise of temperature, that might form the basis for the estimate of the correct dosage. For the present, therefore, it is necessary to be guided by the effect on the eruption itself. Consequently, the treatment will often be a protracted experiment, as it is certain to take several weeks before one may judge the effect of a certain dosage. Under these circumstances, it may often be difficult to keep the patients suffering when improvement perhaps does not appear for many weeks. But, in view of the duration of the lesion itself, this "experimental" treatment cannot be said to require an unreasonably long time. So far, any attempt at forcing the treatment at a quicker rate has been a decided failure.

GOLD CHLORIDE IN OTHER SKIN DISEASES

The complex gold compounds have been tried for several skin diseases, besides lupus erythematosus, for instance, for lupus vulgaris, various other tuberculids, psoriasis and Boeck's sarcoid. The results, however, have been negative, except in the last-mentioned disease, for which English and American authors have claimed to obtain favorable results.

Somewhat the same is true for gold chloride. I used this remedy in the treatment of four patients with Boeck's sarcoid; two apparently were cured, in both instances with a dose of 1 mg., while the other two were not influenced by the treatment, even when the dose was increased.

In two cases of lupus vulgaris I saw the condition subside a little when this treatment was used; but, as the improvement was not lasting, it was not considered advisable to continue the treatment. Nor has any conclusive therapeutic effect from gold chloride been observed in

other forms of tuberculosis of the skin. In psoriasis, the results have likewise been negative.

For the present, then, lupus erythematosus and Boeck's sarcoid are the only skin lesions in which a therapeutic effect from gold chloride has been demonstrated with certainty. Perhaps these observations imply evidence of the relationship that has been assumed to exist between these two lesions, whether this relationship is founded on the possibility that both lesions are particular forms of tuberculosis, as many think, or whether it depends on other circumstances.

SUMMARY

The favorable results obtained with complex gold compounds in small doses in the treatment for lupus erythematosus have conveyed the idea that one might be dealing with a "metal salt effect" similar to that in the well known experiments by Walbum.

In accordance with this theory, a large number of patients were treated by intravenous injections of gold chloride. The injections were given once a week, and the initial dose, 1 mg., was not increased unless there was no effect after several injections. In that case, the treatment was continued with injections of 5 mg.; and if this dose also failed to produce any effect, the dose was later increased to 10 mg. In this way it apparently was possible to cure or to cause decided improvement in so many patients that the results obtained with gold chloride appear to be fully equal to the results obtained with the complex gold compounds. The effect is more uncertain and capricious than the effect of mercury or bismuth in syphilis and, unlike the latter effect, it is not parallel with the intensity of the treatment. On the whole, the most favorable effect is observed after rather small doses and with intervals of one week between the injections.

Combined treatment with gold chloride and Finsen light has given still better results, which exceed those obtained from entirely local treatment or from exclusively internal therapy. The combination of gold chloride and carbonic acid freezing seems also to have a favorable effect.

Only a few incidental effects have been noticed, and none of these has been alarming. In this respect, gold chloride seems to be more advantageous than the complex gold compounds; and as it appears to be at least equal to these in therapeutic effect, there is good reason why the simple salt should be preferred. Besides, it is much cheaper, and the solution may be prepared in any drugstore. In the concentration employed (0.1 per cent), gold chloride is strongly bactericidal, so that sterilization of the solution is not required.

THE USE OF SOLUTION OF PITUITARY IN HERPES ZOSTER *

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The pain in herpes zoster is perhaps the most vital single factor that causes patients to seek relief. When the patient is treated in accordance with the accepted methods by the local application of ointments or dusting powders and with analgesics and roentgen therapy for the pain, the condition usually lasts from two to eight weeks. As a result of clinical experience with the use of solution of pituitary, I believe an effective treatment has been found.

The physiology of the pituitary gland is complex, and one can discuss it only abstractly; therefore I do not consider it within the province of this paper to enter into a discussion of it at large. Only brief mention will be made of the drug used. The commercial preparations used for obstretic cases were administered intramuscularly in dosages varying from 0.5 to 1 cc. The dose, number of treatments and frequency with which the treatment was repeated were governed by the intensity of the pain from which the patient suffered. In most instances the number of treatments required to obtain absolute relief from pain were two, given a day apart. In cases in which the condition consisted of comparatively few zoster patches and the pain was mild, the patient was clinically cured by one treatment. However, there were a number of patients who required three treatments, and one was given six injections.

No attempt is made to claim originality in treating with a solution of pituitary patients who have herpes zoster. Vandel [1] enumerated the benefits to be derived from its use in this disease. He witnessed the prompt and definite action of the drug on patients, whose pain subsided within a few hours. The effectiveness on the lesions was only secondary to that noted on the pain; after several days, the eruption disappeared entirely.

Up to the present time, fifty-four patients have been treated by this method; of these, five were in the second decade, twenty in the third, eight in the fourth, fourteen in the fifth, five in the sixth and two

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* From the Department of Dermatology, Jefferson Medical College and the Northern Liberties Hospital.

1. Vandel, S. N.: Pituitrin and Herpes Zoster, Ugesk. f. læger **85**:222, 1923.

in the seventh. Among these patients, twenty were women and thirty-four were men. The duration of their disease was anywhere from twenty-four hours to five weeks before they were treated with solution of pituitary. From observations in severe cases, one is forced to the conclusion that the treatment is most efficient. Among the patients treated, four suffered agonizing pain.

A woman, aged 47, five weeks prior to her admission to the clinic, noticed for the first time zoster eruptions that involved the left side of the forehead, face, shoulder and upper part of the arm. The pain had been so severe that the patient had lost considerable weight, had slept little and had had general poor health. On examination, in addition to the presence of herpes zoster lesions, the left side of her face was swollen. The swelling was accentuated by a right-sided Bell's palsy, which developed at the time of the onset of herpes zoster. Following the first intramuscular injection of 1 cc. of solution of pituitary, the patient had a fair night's sleep, and there was little discomfort from pain the next day. After an interval of twenty-four hours, she received a second treatment and the third treatment forty-eight hours after the second. The pain subsided entirely following the last treatment. The lesions healed at the end of a week. The patient was then referred to the neurologic department for treatment for Bell's palsy.

The second patient,[2] whose eruption involved the thorax anteriorly and posteriorly on the left side, was a city fireman, aged 34. Owing to the pain and loss of sleep, his general health was impaired. For three weeks, he was treated by the accepted methods without improvement. After the first injection of 1 cc. intramuscularly of solution of pituitary, the patient slept well, and the pain subsided almost to the vanishing point. He was given two more injections of 1 cc. within an interim of forty-eight hours.

The third patient[3] of this group was a woman, aged 70. She was seen twenty-four hours after the onset, which commenced by a chill and a burning sensation of the involved area. Later, there were pain and herpetic lesions that involved the left side of the face between the hair line and the lower lip. The contents of the vesicles were hemorrhagic from the first. Within two hours after the first injection of 1 cc. of solution of pituitary, the patient felt relieved. She continued to complain of pain in her left eyeball. On account of her advanced age, it was deemed advisable to have her admitted to a hospital, where she was treated on five successive days with 0.5 cc. of solution of pituitary. After seven days, she was sent home as clinically cured.

The fourth patient was a man, aged 68. He was admitted to the hospital complaining of excruciating pain in the "right hip." Twenty-four hours later, the right buttock showed a herpes zoster eruption. He was treated daily for two days with 1 cc. of a solution of pituitary, when the pain completely disappeared.

COMMENT

The treatment of patients with herpes zoster with solution of pituitary has much significance. Of 8,229 new patients admitted to the Jefferson Hospital skin dispensary from May 3, 1923, to Sept. 20, 1929, 153, nearly 2 per cent, suffered from this disease. Even in mild

2. Patient of Dr. E. F. Corson.
3. Patient of Dr. Joseph Langbord.

attacks of herpes zoster, there is discomfort; in severe cases, the extreme pain experienced by the patients often impairs their general health. Many of these persons are wage earners, and absence from their occupations complicates their economic problem. The treatment with solution of pituitary contrasted with other accepted methods of treatment has many advantages; particularly in its effectiveness in controlling pain.

Pregnancy is the only contraindication to the treatment. The use of this solution was not found to be unsafe for patients with hypertension or for those of advanced age. The only untoward effect observed was a momentary sensation of faintness experienced by some of the patients.

THE FINDING OF THE LARVAE OF THE CHIGO, TUNGA PENETRANS, IN SCRAPINGS FROM HUMAN SKIN

REPORT OF A CASE *

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The presence of the chigo, *Tunga penetrans,* in lesions in human skin in the tropical areas of the western hemisphere has been a matter of record since 1526.[1] The gravid female has been found commonly in such lesions in man, the dog and other mammals in practically all American countries between 30 degrees north and 30 degrees south latitude, even up to 2,000 meters elevation. However, there is apparently no authentic report of an autochthonous case from the parts of the United States (Florida and southern Texas) lying within that belt. One patient observed in New Orleans more than sixty years ago gave a history of having become infested in Venezuela fifteen days previously. In the case that we are reporting the patient had always lived in New Orleans and had undoubtedly become infested in this locality, although the source of the infestation consisted in sisal hemp which had recently been brought in from Yucatan and was being unloaded. The time of the year (August) was favorable for the propagation of the organism.

According to textbook descriptions [2] both the males and the females of the chigo attack man and other animals:

> . . . But the fertilized female, once she attaches herself to the host, burrows beneath the skin, and becomes completely enveloped. With the forwardly directed mouth parts the insect penetrates the skin very much as a tick does, and the compression of the thoracic segments shortens the body length as far as possible and reduces the risk of detachment by scratching on the part of the host. The parasites show a predilection for the skin around the toes. The fertilized female rapidly burrows her way into the skin, causing a transient irritation, and comes

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* From the Department of Tropical Medicine, Tulane University of Louisiana School of Medicine, and the Dermatology Clinic of the Charity Hospital.

1. Valdes-Oviedo, G. F.: De la natural historia de las Indias, Toledo, 1526, cited by Guyon, J. L. G.: Histoire naturelle et médicale de la chique, Rhynchoprion Penetrans (Oken), Paris, 1870.

2. Macgregor, M.: Fleas (Siphonaptera), in Byam and Archibald: The Practice of Medicine in the Tropics, New York, Oxford University Press, 1922, vol. 1, p. 486.

to rest with the terminal segment of the abdomen just flush with the outer skin surface. In this way the insect is able to obtain air through the last pair of abdominal stigmata, and to discharge her ova when matured. As the eggs develop her abdomen swells until it attains the size of a small pea. The area on the toe where the parasite lies is generally by this time slightly inflamed and painful. The eggs are discharged singly, and fall to the ground where they undergo development after the manner of all fleas. When the eggs are laid the parent dies and shrivels up.

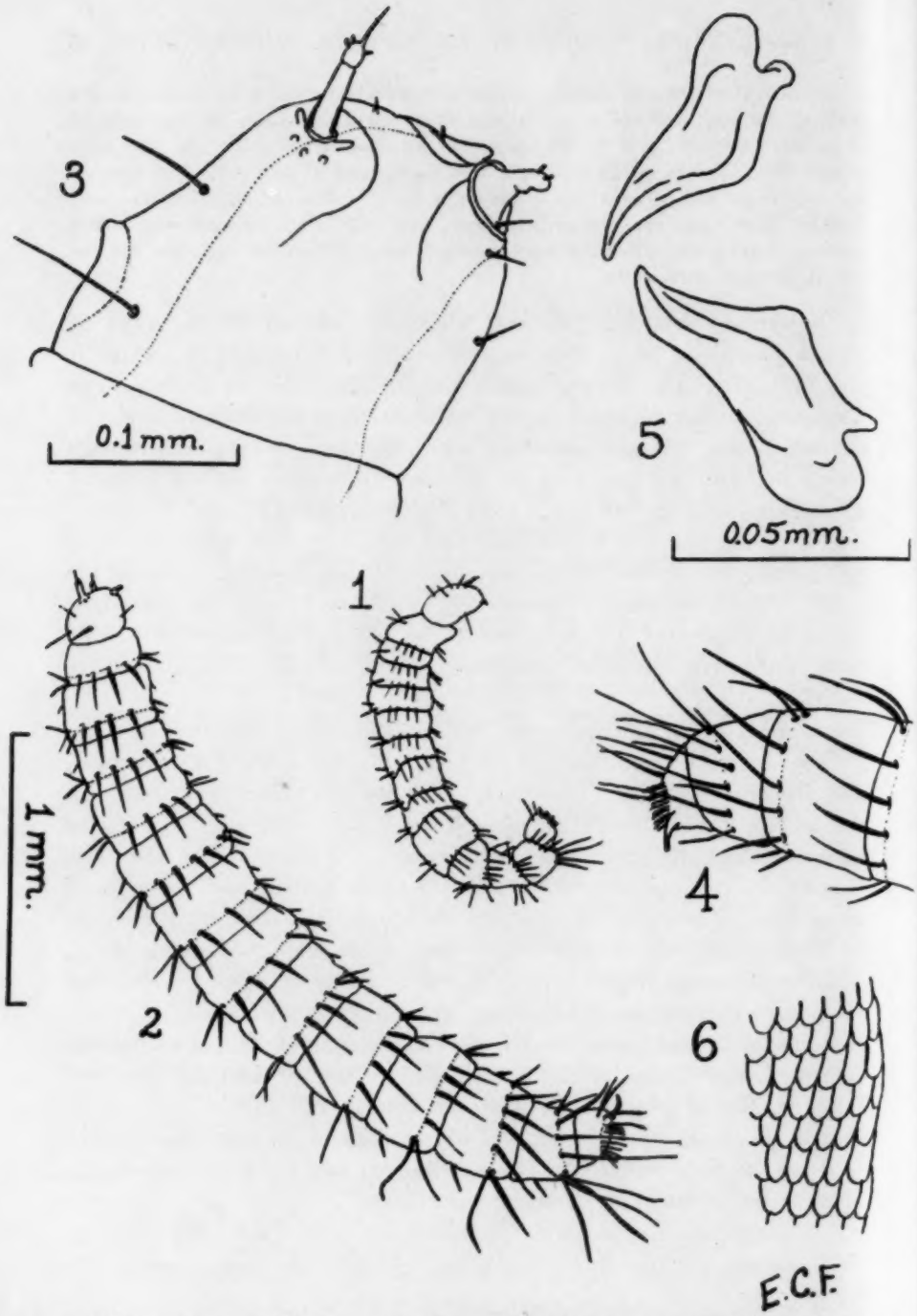
Newstead,[3] who has provided a detailed account of the larva of *Tunga penetrans,* states that they are extremely difficult to locate; it was only after a prolonged search that he succeeded in finding three specimens, which occurred among the dust from the floor of a native hut which was "literally swarming with chiggoes." The skin scrapings which the patient brought to us were seen to contain several hundred small verminous objects which were rapidly crawling about. Examination with the low power lens confirmed our impression that they were flea larvae, which were in several stages of development. Among the débris were a number of empty egg shells and three or four dark chitinous fragments which proved to be portions of shriveled female fleas; these were, however, inadequate for diagnosis. No pupae were found.

A study of the motile larvae indicated that they differed considerably in structure from those of the common human flea, *Pulex irritans,* and its near relatives. However, their several structures, shown in the accompanying illustration, agreed detail for detail with Newstead's material, including the number of segments, the number, size and position of the papillae around the base of the antennae, and the type of mandibles. There can be no doubt, therefore, that they are the larvae of *Tunga penetrans.* Several of these larvae were filled with blood, and the advanced stage of development of many of them showed that they were thriving in the location where they were found. Whether this ingested blood came directly from the lesions of the patient or had been first ingested by the mothers, passed by way of the anus, and then taken in by the progeny, we were not able to ascertain. Certain it is that in this case, which is unusual if not unique,[4] the eggs had hatched in or on the body around the sites of the burrows of the gravid females, and the larvae had thriven and grown there.

Although the common foci of infestation with *Tunga penetrans* on the body are the toes and the plantar region of the foot, these insects

3. Newstead, R.; Dutton, J. E., and Todd, J. L.: Insects and Other Arthropoda Collected in the Congo Free State, Ann. Trop. Med. Parasitol. **1**:93-94, 1907.

4. Dr. Herbert C. Clark has informed us verbally that he once found the larvae of the chigo in epidermal débris sent him for diagnosis from one of the hospitals of the United Fruit Company.



1. Young larva of *Tunga penetrans* recently hatched from egg; × 37. 2. More mature larva; × 37. 3. Anterior end of developing larva, showing details of right antenna and the papillae that surround its base, and the cephalic setae and palp on the right side; × 360. 4. Caudal end of developing larva, showing clasper and distribution of setae on right side; × 37. 5. Unidentate mandibles of the larva; × 700. 6. Scale-like appearance of the cuticle of the larva; × 700.

have also been recovered from other parts of the body. In the case here described the feet were not infested, but there were macular patches in the inguinal and pubic areas and on the lower right quadrant of the abdomen. This peculiar distribution of the lesions is accounted for by the patient's habit of sitting on piles of sisal hemp while checking its unloading. At first they produced an intense itching, particularly at night, which was partially relieved by scratching. Later the patient "felt worms crawling in his skin layers."

The infestation was apparently cleared up by the patient himself, who painted the lesions with tincture of iodine.

REPORT OF CASE

P. T., a white man, a resident of New Orleans, employed as checking clerk for cargoes of sisal hemp from Yucatan, gave a history of having sat on piles of sisal during checking. When first seen he complained of infestation of about two weeks' duration, involving the skin of the pubic and inguinal region and the lower right quadrant of the abdomen. This produced intense itching which was partially relieved by scratching. At times he "felt worms crawling in the skin layers." He had painted the areas with iodine. When seen by one of us (T. A. M.), the areas described showed long reddish scratch marks but no punctate spots, hemorrhages or other evidences of an epizoic infestation. However, an epidermophytosis was apparent in and around the areas in question. Phenolized Whitfield's ointment was prescribed. When seen later by one of us (E. C. F.), the original lesions had entirely disappeared, the epidermophytosis was improved, and the itching had subsided.

SUMMARY

In an unusual if not unique case occurring in New Orleans, large numbers of flea larvae were found in scrapings from the skin of the pubic and inguinal regions and the lower right quadrant of the abdomen. They proved to be larvae of the chigo, *Tunga penetrans*, which had developed in or around the sites of the lesions where the pregnant females had burrowed in. The infestation had been apparently cured by painting the area with tincture of iodine. The patient's history indicated that the affected parts had been in contact with sisal hemp which was being unloaded from Yucatan. The various stages of the larvae and their diagnostic features are shown in the accompanying illustration.

THE NATURE OF MELANOMA

REPORT OF A CURED CASE *

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Those of the medical profession who are in touch with dermatology are aware of the grave prognosis associated with melanoma. The literature pertaining to that subject reveals that writers agree in emphasizing the enormous mortality. Melanoma is one of the most malignant of all the neoplasms.

So treacherous can this condition prove that when the patient, the history of whose case is herein given, applied for treatment it was deemed best not to remove a piece of the morbid tissue for a study of its pathology. Biopsy, which might have been performed by means of endothermy, was also rejected as unwise because of the fear that general dissemination and metastasis would follow, as the growth had been frequently manipulated and was increasing in size rapidly. Instead, the decision was made to destroy the growth at once in its entirety.

The history in this case and the clinical observations fully justified the diagnosis of melanoma, and neoplasms of vascular, granulomatous, infectious and inflammatory origin were readily excluded.

Noteworthy is the appended description of an interesting operation performed by Dr. Gustave Aufricht. This operation was undertaken to repair the permanent ulcer that had resulted from the destructive action of the radium used in the treatment of the melanotic neoplasm.

The latest information in this case is that the melanoma has not recurred, although more than five years have elapsed since the removal of the lesion. For this reason and also because there is a paucity of such case reports in the published records on this important subject, we deem worthy to add to the literature the following case report.

REPORT OF CASE

A man, J. S., aged 50, a native of the United States, married, a clerk, applied for treatment of a tumor of the nose on Jan. 26, 1924. The tumor, he said, had been growing ten years. It had developed on the site of a mole which had been

* Submitted for publication, Nov. 18, 1929.

present from early childhood. Ten years prior to his application for treatment, he had noticed that the mole was becoming elevated and slowly increasing in size. Several physicians had subsequently applied treatment, employing excision and caustic applications. The lesion had diminished in size after treatment, but had never been completely removed. There were always recurrences, the tumor growing larger until it finally covered the major area on the right side of the nose.

On examination the tumor was seen to extend from the level of the inner canthus of the right eye to just above the nasolabial fold. In measurement, it was 2.5 cm. in length, 1.5 cm. in width and 0.5 cm. in elevation.

The color was a brownish slate, and the top of the tumor was convex and irregular. The elevated tissue was firm and rose from a broad base. The tumor was sharply demarcated from the surrounding skin, and was not attached to the bone. Dilated blood vessels coursed over its surface, and in the central part of the top it was slightly necrotic and covered with a firmly adherent, brownish-red crust.

A B

Fig. 1.—*A*, about three weeks after insertion of radium. Note reaction and oozing from liquefaction of tumor. *B*, note persistent ulcer, partial healing, scar tissue, and exposed nasal bone.

Puncture of the growth revealed that it was neither cystic nor vascular; there was no clinical evidence of either syphilis or tuberculosis, and cervical adenopathy was not present.

Diagnosis perforce was made on purely clinical grounds, owing to the decision to destroy the growth. Though biopsy was considered, this was not performed as incision was deemed unwise. The diagnostic conclusion of melanoma was reached on the grounds that the tumor had developed from a mole, the presence of the latter from childhood, the color of the morbid tissue and its persistence and tendency to recurrence and growth after treatment.

Four days after the application of the patient for treatment, the tumor was treated with radium. Twenty seeds of radium emanation, each containing 0.5 millicurie, were implanted in the body of the tumor. The seeds were not removed, but later sloughed out with the breaking down of the lesion. It was estimated that a total dose of 1,569.4 millicurie hours of radium was administered.

The reaction of the tumor following the insertion of the radium was intense. It became swollen and inflammatory. The right eyelids were so red and puffed that soothing wet dressings were applied. Two days later, the left eye was also becoming swollen and edematous.

At the end of a fortnight, the swelling of the eyelids continued and increased; the right eye showed conjunctivitis, and the tumor itself betrayed a tendency to slough.

Three weeks after the insertion of radium, the acute reaction began to subside. Examination revealed a large, slightly cauliflower-like, necrotic, bleeding tumor on the right side of the nose. The right eyelids were still puffy, and liquefaction was continuing. The patient complained of pain, which was more marked at night. The right cervical lymph nodes became enlarged and in the tumor itself there was progressive liquefaction with profuse discharge. In the skin of the surrounding areas, necrosis developed, and for a time it was feared that the right eye might become affected. These areas of necrotic tissue on the skin were easily removed by means of endothermy.

Six weeks after the insertion of the radium, the whole tumor had sloughed out, leaving an ulcer, its floor formed by the underlying nasal bone. This ulcer was depressed, irregular, had thin walls and discharged a clear serum.

In view of the fact that the lymph nodes tended to remain enlarged, roentgen therapy was applied to the right cervical nodes. The ulcer was then subjected to ultraviolet ray therapy. Two months after its removal another examination of the ulcer showed it to be one-half its original size; the tissue was clean but the depression extended down to the bone. The ulcer continued to diminish in size, but at a slow rate, from this time on.

A year after the original radium treatment of the tumor, it was decided that the resultant ulcer should be closed by means of a skin graft. The patient was referred to Dr. Gustave Aufricht, who performed the operation on Jan. 15, 1925, and who gives the following description of it.

SURGICAL REPAIR OF RADIUM ULCER

Operation to cover the ulcer with skin graft was performed under local anesthesia, 2 per cent solution of procaine hydrochloride with epinephrine for the nose and the same solution without epinephrine for the flap.

The bony sequestrum on the bottom of the ulcer was removed, and the thin, scarred edge of the skin around the ulcer was excised. Under the sequestrum, the thin atrophied mucous membrane of the nasal cavity was found and saved for lining the flap.

Before the region of the skin flap was infiltrated with procaine hydrochloride, the right frontal artery was palpated carefully, point by point being marked on the skin with tincture of iodine. The frontal artery was traced from the medial end of the right eyebrow, a distance corresponding to the length of the distance from the ulcer. Then an extra 0.5 cm. was allowed in order to turn the pedicle for 180 degrees. The iodine points were connected by a line marking the projection of the frontal artery on the skin, and both sides of this line were carefully infiltrated with a small amount of 2 per cent procaine hydrochloride. The needle employed was pointed outward to prevent puncture of the vessels. The procaine used for this part of the anesthetization contained no epinephrine in order to avoid contraction of the blood vessels, which might conceal an injury to the vessel.

After the injection of the procaine hydrochloride a superficial skin incision was made over the frontal artery; oblique incisions were made on each side of

this artery, and a narrow pedicle that contained the vessels was dissected. A full thickness, round skin flap, large enough to cover the ulcer, was excised from the area nourished by the frontal artery, but care was observed not to break its continuation to the distal end of the pedicle. Then, with blunt, curved scissors, a channel was cut under the skin between the medial end of the right eyebrow and the ulcer on the side of the nose. When the channel was large enough for

Fig. 2.—Successive steps of covering ulcer by full thickness flap.

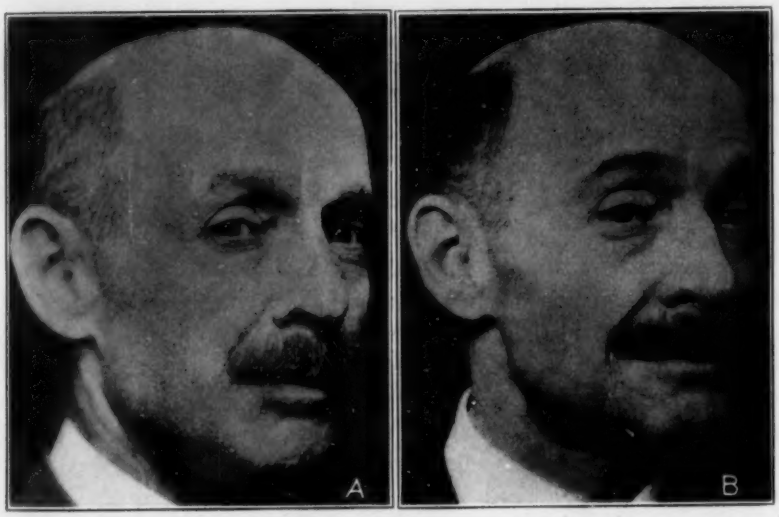

Fig. 3.—*A*, appearance of repaired wound about three months following operation. *B*, photograph taken five years after treatment shows absence of recurrence and good cosmetic result.

the passage of the skin flap, the flap was pulled through the channel into the defect on the nose, the rest of the pedicle containing artery, vein and nerves being left buried in the channel.

The skin flap was now sutured into place with interrupted dermal sutures, and the secondary defect on the forehead was closed by means of silk and dermal sutures.

In this way, the skin flap from the forehead did not suffer from any change in blood supply, and the healing was accomplished without necrosis. The original nerve supply was also contained in the grafted skin flap.

If these procedures are carefully followed, the grafted area grows red or pale, and its temperature and sensory reactions are similar to those of the skin on the rest of the face.

Examination of the patient in 1929, five years after the treatment, revealed no recurrence of the original growth; the graft looked healthy and was of the same color as the surrounding skin.

PATHOGENESIS

Nevi are small, circumscribed malformations of the skin which are hereditary or congenital, and which may manifest themselves at any period of life. The soft, sessile type, which may or may not be pigmented, is usually seen in infants and children. The other forms—subsessile, fungoid, molluscoid—are most often encountered in the adult. As a rule, the nevus is a congenital abnormality that consists of overgrowth and pigmentation of the epidermis with all the accessory structures, such as hair, sebaceous and sweat glands and sometimes including angiomatous structures.

Microscopically, columns or cords of alveolar cells can be distinguished aggregated underneath and close to the epidermis. These cells occupy the papillary bodies and parts of the cutis. Occasionally the cords of the nevus cells follow the hair follicles and ducts of the cutaneous glands. The cell cords consist of small, cubical or elongated cells, rich in protoplasm, and having relatively large, clear, vesicular nuclei resembling the surface epithelium. The cells toward the periphery of the lesion are found to be more columnar in outline.

The earliest indication of pigment deposit is the appearance of fine, yellow granules in the swollen basal cells; the appearance of this pigmentation is nearly identical with that of normal pigmentation. As the epithelial proliferation progresses, foci of the new cells exhibit increased pigmentation. Certain cells in the group develop profuse pigment, increase in size and become elongated and multipolar; they are the so-called dendritic cells. In pigmented moles there are, usually, numerous chromatophores lying beneath the epidermis, and occasionally within the malpighian layers. In some cases these cells are absent. The pigment is never found deposited in the nucleus of the cells, and can be demonstrated only in the cytoplasm.

The adult nevus always contains an abundance of fibrous tissue that has received various interpretations. The nevus may undergo various benign changes. New fibrous tissue may replace most of the cellular structure; the nevus cells may atrophy, lose their cellular outline and finally disappear; or at times the cells may undergo mucinous degeneration, to be finally extruded and replaced by fibrous tissue. In such cases,

the pigmentation is apt to be rather scant and occasionally entirely absent. The nevus may be replaced by a scar of fibrous tissue.

Clinical observers have come to recognize a well defined stage in the history of the nevus. Among others, Dawson [1] designated it as the precancerous stage. In this stage, the mole or pigmented nevus displays a tendency toward increased proliferation and invasion of adjacent tissues. As a rule, metastasis is not encountered, but through excessive irritation and absence of adequate treatment, the true malignant form supervenes.

Malignant changes are often observed in moles that have been dormant for a long period. Reasons for such changes have not been discovered, but the consensus among clinicians is that the cause is excessive irritation and repeated local injury. Instances have been reported in which malignant changes have followed incomplete surgical removal of the mole. When this happens, the nevus begins to grow and invade the surrounding tissues, the adjacent lymph nodes enlarge and become palpable, and metastases to other organs develop rapidly. The histologic signs of malignancy can be easily detected. They consist of increased vascularity, hypertrophy of the cells with hyperchromatism of the nuclei and occasional mitotic figures. Grouping of polyhedral and epithelioid cells in alveolar formation may occur; pigmentation is usually increased, though in some cases the deposit of pigment may be scant. The rete pegs and the cells of the basal layer may also disclose increased pigmentation.

Metastatic extension of the melanoma occurs either through the lymph nodes or through the blood vessels. In the former instance, the regional lymph nodes are involved early, and the generalized metastasis is relatively slower than when the extension occurs through the blood stream. Before the invasion of the nodes, there is pronounced hyperplastic lymphadenitis.

By way of the blood stream the dissemination is much more rapid and more generalized, but the exact mode of extension cannot be determined by histologic study. Occasionally an accumulation of tumor cells is found around blood vessels; this usually indicates a grave prognosis.

The size and form of the cells in some of the malignant moles vary greatly. While some assume an epithelioid character, others are small and round with no special characteristics. The metastatic tumor may be alveolar in type or appear as a diffuse carcinomatous growth; occasionally it simulates spindle cell sarcoma, perithelioma or lymphosarcoma. In metastatic tumors of the cutaneous melanoma are often found large round or polyhedral cells which may or may not contain pigment.

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1. Dawson, J. W.: The Melanomata, Edinburgh M. J. **32**:507, 1925.

These cells at times may be the first indication of malignant cutaneous melanoma. Metastatic nodules may at first be surrounded by hemorrhages from dilated blood vessels, and absorption of the blood may be followed by cicatrization and marked repression of the tumors. In some cases, there may be numerous pigmented points in the skin, the serous and the mucous membranes. These lesions may contain so much pigment with so few tumor cells as to suggest emboli of the pigment. The amount of the pigment in metastatic tumors varies greatly; in some cases it is abundant, while in others it is scanty. When it is excessive, it may lead to destruction of tissue and formation of cysts containing black fluid. There is no relationship between the intensity of pigmentation in primary and secondary tumors.

REVIEW OF THE LITERATURE

Virchow [2] was the first investigator to classify the pigmented tumors of the skin as sarcomatous and carcinomatous melanomas. No systematic attempt had been made prior to his time to differentiate the pigmented growths. His conclusions were based on histologic observations. Pigmented tumors of the skin with a diffuse growth of spindle cells Virchow called melanosarcomas, and those with an overgrowth of alveolar tissue he called melanocarcinomas. This classification was not accepted, however, by all critical students of neoplasms. Since his day, the etiology of melanotic tumors has been a fertile field for both research and controversy.

Demieville,[3] in 1880, as a result of research, concluded that the nevus cells have their origin in the perithelial and endothelial tissues of the blood vessels. Two years later, Recklinghausen,[4] while accepting Demieville's theory, was inclined to see the resemblance of these neoplasms to the multiple fibromas of the skin. Ribbet [5] and Ehrman,[6] at varying times from 1896 to 1914, pronounced the theory that pigmented tumors arise from highly specialized mesodermal cells, the melanoblasts and chromatophores, and also from their abberations. Kromayer [7] and others, however, refuted this theory.

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2. Virchow, R.: Die krankhaften Geschwülste, Berlin, A. Hirschwald, lecture 19, vol. 2, p. 222.

3. Demieville, P.: Ueber die Pigmentflecke der Haut, Virchows Arch. f. path. Anat. in Berl. **81**:333, 1880.

4. Von Recklinghausen, F.: Fibrome der Haut, Berlin, A. Hirschwald, 1882.

5. Ribbet, H.: Ueber das Melanosarkom, Beitr. z. path. Anat. u. z. allg. Path., Jena, **2**:471, 1897; Das Chromatophoron, Melanoma, Allg. Path. u. path. Anat. **1**:262, 1911; Das Chromatophoron, Melanoma, Geschwulstlehre, Bonn, 1914, p. 318.

6. Ehrman, S. Das melanomatische Pigment, Biblioth. Medica, 1896, part 511, no. 6.

7. Kromayer: Ueber das Melanosarkom, Beitr. z. path. Anat. u. z. allg. Path. **22**:412, 1897.

Unna,[8] in 1893, established his elaborate theory of the origin of melanoma. He believed in the epithelial origin of the nevus cells, and said that the prickle cells are transformed into the true pliable ameboid-like cells of the nevus. However, he did not account for the excessive fibrous tissue normally found in nevi of elderly people, nor did he explain the origin of this type of cell.

Later investigators attempted to explain the accumulation and overgrowth of fibrous tissue. Kromayer [9] and Judalevitch [10] said that fibrous tissue originates in the transformed pigment cells. Their theory was that through the gradual loss of chromatophore fibrils, pigmentation is followed by depigmentation and isolation of pigment, which favors the transformation of the cells into those of the fusiform type with fibrillar prolongations. Another explanation of fibrous cells is offered by Favera,[11] who held that these cells develop from preexisting tissue of the derma.

By assuming that the nevus cell is a modified fibroblast, Riecke [12] and Pini [13] bridged over any difficulty in explaining the genesis of fibrous tissue. Masson [14] demonstrated that there are elements of nervous tissue in moles, and Soldan,[15] before him, pointed out the existence of nerve fibrils in groups of nevus cells, while confirming Recklinghausen [4] in the latter's contention that there is proof of a connection between nevi and neurofibromas.

In 1898, DeAmici,[16] in a treatise, classified melanoma as melanosarcoma. He believed that it originated in moles and in pigmented spots, and that it was always malignant and usually ended fatally.

In 1905, James C. Johnston,[17] in his monograph on the subject, concluded that melanotic neoplasms are of wide diversity in origin and are best classified as melanomas. He also stated that melanomas, the

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8. Unna, P. G. The Histopathology of the Diseases of the Skin, New York, The Macmillan Company, 1896, p. 745.

9. Kromayer: Die Desmoplasia der Epithelzellen, Monatsh. f. prakt. Dermat. **41**:477, 1915.

10. Judalevitch: Zur Histogenese der weichen Nevi, Arch. f. Dermat. u. Syph. **58**:15, 1907.

11. Favera: Zur Kenntniss der Pigmentnaevi, Beitr. z. path. Anat. u. z. allg. Path. **43**:43, 1908.

12. Riecke: Zur Naevusfrage, Arch. f. Dermat. u. Syph. **65**:92, 1903.

13. Pini, G.: Ein Fall primärer Hautsarcomatose, Arch. f. Dermat. u. Syph. **61**:103, 1902.

14. Masson, P.: Diagnostics de laboratoire: II. Tumeurs, Paris, A. Maloine & fils, 1923, p. 599.

15. Soldan: Ueber die Beziehung der Pigmentmaler zur Neurofibromatose Langbecks, Arch. f. Chir. **59**:261, 1899.

16. DeAmici: Tr. XII. Congr. of Med. Moscow, Brit. J. Dermat. **9**:440, 1897.

17. Johnston, James C.: Melanoma, J. Cutan. Dis. **23**:1 (Jan.) 1905; **23**:49 (Feb.) 1905.

histogenesis of which it is impossible to determine, are derived from the endothelium of lymph vessels.

According to Gans,[18] who quoted Jadassohn,[19] melanosarcoma arises from the so-called mongolian marks and blue nevi described by Jadassohn. The pigment and chromatophores are limited to the true derma, and the epidermis appears normal on histologic study. On the other hand, he said that melanocarcinoma has its origin in nevi and pigmented moles. These are truly epithelial growths and may arise in any place where pigment is deposited. These conclusions were also confirmed by Bloch,[20] who stated that he found the distribution of pigment in the blue nevi and the mongolian marks to be entirely different from that in pigmented moles and ordinary nevi.

Fordyce,[21] in an article published in 1910, stated that some doubt still existed as to the origin and nature of these growths, and that he preferred to call them by the noncommittal name of melanomas.

Another investigator, Ewing,[22] is not convinced that the time has yet arrived when melanoma can be definitely classified as melanocarcinoma and melanosarcoma on the basis of histologic research. The differentiations are not clear enough, he said, to permit a definite distinction. He would, therefore, apply the term melanoma to all cutaneous pigmented tumors, whether or not their microscopic pictures suggested chiefly sarcomatous or carcinomatous degeneration.

More recent researches of Dawson reveal that he regards malignant nevi and pigmented moles as melanocarcinomas. He agreed with Unna in the belief that the nevus cells is of epithelial origin, but disagreed with him in the belief that the prickle cell is the forerunner of the melanoma cell. That the basal cell is the parent cell of both nevus and melanoma cells and is also responsible for formation of pigment, is the opinion of Dawson. This point of view has been verified by researches of B. Bloch and his associates. By means of the dopa reaction, 3,4-dioxyphenylamine, these investigators were able to demonstrate all the areas of pigment deposit, and thus, by their results and conclusions, to verify Dawson's statement.

Among recent investigators, Gans is the one who made a clear distinction between melanosarcomas and melanocarcinomas, but he added,

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18. Gans, O.: Histologie der Hautkrankheiten, 1928, vol. 2, p. 385.

19. Jadassohn, quoted by Gans: Histologie der Hautkrankheiten, 1928, vol. 2, p. 399.

20. Bloch, B.: Das Pigment, Handb. d. Geschlechtskr. **2**:385, 1927

21. Fordyce, John: Melanomas and Some Types of Sarcoma of the Skin, J. A. M. A. **54**:91 (Jan. 8) 1910.

22. Ewing, J.: Neoplastic Diseases, Philadelphia, W. B. Saunders Company, 1928, p. 919.

nevertheless, that the former have been insufficiently studied. He made a particular point of the paucity of the published case histories. Gans' classification is based on the description made by Darier [23] in 1925.

SUMMARY AND CONCLUSION

To recapitulate: The case herein reported is one of melanoma beginning as a pigmented mole, which, on account of insufficient treatment, enlarged to several times its original size, grew darker and spread toward the eye. The whole mass, with the exception of a small area at the lower border, was destroyed by means of a dose of 1,569.4 millicurie hours of radium; the remaining small portion was removed by application of endothermy.

A deep, permanent ulcer that developed subsequent to the radium treatment was repaired by means of an artery flap pulled down from the forehead. In the treatment of similar ulcers, especially on the face, it is recommended that care should always be observed to have the skin flap used in the graft contain both blood vessels and nerve supply to give a successful physiologic and cosmetic result.

It becomes apparent in a study of the literature pertaining to the pathogenesis of melanomas that the writers appeared uncertain as to the exact origin of these neoplasms. More recent researches tend to indicate that melanosarcomas arise in mongolian marks and blue nevi, while melanocarcinomas develop from pigmented nevi. Primary cutaneous melanomas, however, according to almost unanimous opinion, have their anlage in the pigmented mole.

Some authors use the term melanoma as synonymous with melanocarcinoma and melanosarcoma. In this paper, we have employed the word melanoma to designate a growing pigmented tumor arising from an apparently malignant mole. Clinical observations alone are not definitive enough to class a melanoma as carcinomatous or sarcomatous. Even after careful microscopic study, pathologists are frequently at a loss to state definitely whether the tissue is cancerous or sarcomatous. At present at least, it would seem best to employ the term melanoma for all forms of pigmented tumors.

There can be assigned no definite reason for the transformation of an ordinary mole into a malignant melanoma. It is the opinion of the majority of clinicians that excessive irritation and repeated local injury seems to foster the growth in most instances.

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23. Darier, J.: Le melanoma, Bull. de l'Assoc. franç. pour l'étude du cancer, vol. 14, p. 221; Mélanses, mélanome et mélanosarcoma, Bull. Soc. franç. der dermat. et syph., 1925, vol. 32; in the Report from the Reunion Dermatologique de Nancy, July 18, 1925.

In prognosis, melanomas must be regarded as among the most malignant of cutaneous neoplasms. Metastasis may occur through the blood or the lymph systems, and in the majority of cases the disorder terminates fatally.

In the treatment of these tumors three methods of early and complete destruction are recommended: first, radium therapy; second, wide excision with radium therapy, and third, endothermy combined with radiotherapy.

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LEPROSY

TREATMENT BY MEANS OF A SPECIAL VACCINE *

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During my present visit to the United States of America, I have had the great pleasure and privilege of visiting various dermatologic clinics and of having conversations with leading American dermatologists in Baltimore, New York and Washington. I have thus learned many things and wish to take this opportunity of thanking my American brothers for their many kindnesses.

During the course of these conversations, I found that American dermatologists and public health authorities were, like myself, skeptical as to the ultimate curative value of the various oils and their derivatives so much in vogue for the treatment of lepers. I told them about my personal experiences with a special vaccine which I devised and used as long ago as 1914. Dr. McCoy expressed surprise that an Englishman should advocate any other treatment than the use of oil derivatives. The interest expressed by my American colleagues in my treatment has made me decide to submit this paper for publication in the ARCHIVES OF DERMATOLOGY AND SYPHILOGY.

Previous to 1914, the failure to cultivate the leprosy bacillus on artificial mediums was considered an obstacle to the treatment of patients with leprosy by a vaccine. For several years, I wanted to test the effect of a vaccine made directly from a leprosy nodule. Such a nodule in a case of well developed nodular leprosy is so crammed with bacilli that it is a natural culture.

In March, 1914, I had the first opportunity of testing this theory. A patient with severe, yet previously undiagnosed, nodular leprosy consulted me. The facies was typical: marked protuberance of the eyebrows, broad nose, great swelling of the ear lobes, nodular masses all over the face, with considerable pigmentation of the skin. Freely scattered over the trunk and limbs were numerous flatter nodules, pale areas alternating with areas of deep, yellow-brown pigmentation. Pain sense was deficient, there being complete or less marked anesthesia of the arms, especially on the ulnar side, and complete anesthesia of the anterior aspect of the lower extremities for about one third of the area

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above and below the knees. A large, nongranulating, painless ulcer covered one knee. There was constant nasal discharge and profuse expectoration. The ulnar nerves were enlarged and insensitive to pressure. The nasal discharge and the sputum swarmed with acid-fast bacilli. A nodule excised from the chin without pain showed the typical structure of the leprosy nodule, with large numbers of bacilli. This nodule was used to make the vaccine, as described later.

Before administering the vaccine, I tested the patient with other treatment. Esters were not then in vogue, but I gave him massive doses of chaulmoogra oil by mouth, which fortunately his stomach was able to bear without distress, boric nasal douches followed by perchloride of mercury spray and inunction of nodules and treatment of ulcer with an ointment of ammoniated mercury and sulphonated bitumen, N. F. Practically no improvement resulted; the ulcer showed no signs of healing, and there were febrile attacks with fresh erythema and developing nodules. I presented the patient at this time in London and outlined the way in which I proposed to make the vaccine.[1]

The first dose of the vaccine was too small to produce a visible reaction, but a week later the nasal discharge and sputum were notably reduced; the ulcer was healing rapidly. Four weeks after the first dose of the vaccine, the ulcer was reduced to a small scabbed lesion, and I gave a second dose which was twice as large as the first; this was followed by practically no fever but the eruption of patches of erythema, which later faded, leaving slight pigmentation but no nodules. Rapid and complete healing of the ulcer followed, with complete cessation of the nasal discharge and sputum, and nasal and pharyngeal swabs failed to collect demonstrable bacilli; all the nodules became small, many disappearing entirely; sensation to pain began to return, and the ulnar nerves became sensitive to pressure.

The patient continued to receive the dose of vaccine once a month, and the symptoms steadily diminished, until in 1914 it was impossible to find any distinct evidence of leprosy. About this time, my stock of vaccine became contaminated, and the treatment with vaccine was stopped for several months, but the chaulmoogra oil was continued as before. New crops of erythema developed, some of which became nodular, and the scar on the knee broke down. I excised a portion of skin (the patient felt pain) from the arm, which included a new nodule and the pigmented site of an old one, but nowhere could I find lepra bacilli in it.

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1. Williams, A. W.: Proc. Roy. Soc. Med., Dermatological Section **8**:140, 1914.

Dr. Turner then kindly sent me a nodule excised from a patient with a severe case in the Essex home for lepers. A new vaccine was made from this. For several months my patient was given doses every four weeks, and he improved greatly. The condition then became stationary; with difficulty a few nodules could be made out by palpation in the legs and arms. He then was given the vaccine every second week and later every week. Eventually, the last of the nodules disappeared, and he had no reaction from the vaccine, but the treatment was continued until the close of 1919. I then made a most careful examination. In front of the thigh I could just detect a slight sense of resistance to pressure of the fingers which felt like fibrous thickening; sensation here and elsewhere was normal. The sclerotic conjunctiva looked as though it was slightly thicker than normal. The patient then made a happy marriage and started life again on a small farm. All treatment for leprosy was stopped. He has a child.

Early in 1925, he came to see me and told me his vision was bad; he had attended the great eye hospital in London, and had been told there to have his tonsils removed. This was done. I could detect no evidence of leprosy. I wanted him to see our ophthalmic surgeon at the county hospital, but this was not done. He came to me again later. I still could find no evidence of leprosy, except that his sight was worse. I then told him to see an ophthalmic colleague of mine, Dr. Mary Cripps. She did not think that his eye trouble was due to leprosy, that, in fact, it was a familiar condition in chronic streptococcal infection. She treated him for a time, and he improved a little, but on his giving up treatment sight became worse. I suggested a return to antileprotic treatment, but he was unwilling and I did not persist.

The last time that I presented the patient at the Dermatological Section of the Royal Society of Medicine, Professor Castellani told us that Dr. Nicholas and he had treated some patients with a vaccine made by triturating nodules and had obtained temporary good results. Dr. Graham Little also told us of a patient whom Sir A. E. Wright had treated at St. Mary's Hospital with a similar vaccine. At first there was remarkable improvement, but the patient rapidly relapsed while injections were being given, and the treatment was discontinued.[2] It is to be noted that preliminary desiccation of the nodule was not described in these cases.

METHOD OF PREPARING THE VACCINE

1. Choose a likely nodule, e. g., one on the face or an exposed part. Paint it with tincture of iodine and excise it with as little of the surrounding skin as possible, using a sterile knife. At once cut in half; place one-half in a sterile

2. Williams, A. W.: Tr. Roy. Soc. Med., Dermatological Section **14**:50, 1920.

dish and put in a desiccator over sulphuric acid; place the desiccator in a cool chamber and keep the nodule in the desiccator for at least four weeks. Examine the other half histologically and estimate approximately the proportion of bacteria to tissue. Concerning the last vaccine I made, I wrote the following notes:

The weight of the desiccated tissue to be used is 22 mg.; of presumable bacillary tissue, about 5 mg.

2. Grind the desiccated tissue in a mortar with a small quantity of physiologic solution of sodium chloride and sterile white sand (wearing an absorbent cotton respirator) and place the mixture in a sterilizer at 60 C. for four hours. Then completely grind and gradually make up to 5 cc. with physiologic solution of sodium chloride, grinding well during this addition.

3. Centrifugate for three minutes and decant the surface opalescent fluid into a flask.

4. Grind the deposit with 5 cc. as before.

5. Centrifugate, decant, and repeat the process four times, decanting into the same flask.

6. Let the liquid stand awhile, pipet a drop from the bottom of the flask and examine it to see if it is free from sand.

7. Sterilize as described (2).

8. Label 30 cc. of well stirred decanted liquid diluted with 2 cc. of 10 per cent phenol, "Original emulsion 1 cc. = 0.1 mg.; bacterial substance (approx.)."

9. Stir the original emulsion well (with sterile syringe) and remove 0.5 cc. and dilute up to 50 cc. and label, "1st Dilution 0.001 mg. in 1 cc."

10. Stir first dilution and remove 0.5 cc.; dilute up to 50 cc., and label "2nd Dilution." Sterilize as described (2). Test with plate culture and if sterile give 0.2 cc. (3 minims) as the initial dose. If no reaction follows, give 6 minims (0.4 cc.) for the second dose. Inject subcutaneously. The vaccine at first must not be given more often than once a month.[3]

Of course, the dose is largely experimental. Determination of the dosage requires careful consideration of the degree of leprosy from which the patient suffers, and the first dose is always a rather touchy question. It is better to give too small than too large a dose, and the greater the degree of leprosy the less the dose. With experience, one obtains confidence in this as in other things. I may now give an example of harm done by an excessive dose.

CASE 1.—After I had treated my first patient for some time, he went to a small home for lepers, where he remained under my treatment, being seen once a month at first. Later, a patient with a severe case of nodular leprosy was admitted into the same home. This patient, seeing and hearing how well my patient was, requested a dose of the vaccine. A dose was given him, which proved to be too large for his condition. He had an intense reaction, and for a time was dangerously ill. I did not see this patient, but I received a letter from a friend, a

3. I fixed the interval of one month between the first doses of the vaccine because (1) the improvement continued undiminished for a month, and because (2) in experiments in the determination of the opsonic index to tubercle bacilli in tubercular skin involvements I found the average negative phase nearly a week and the positive three weeks, and I got better results with a month's interval than with more frequent doses of a tubercle vaccine.

famous dermatologist, telling me of this; he said that he was convinced that my vaccine was dangerous, but that, as the patients had faith, they wanted to continue it. He asked me to advise them to give it up and to use instead a chaulmoogra oil preparation. I wrote to my patient, telling him the opinion I had had from a man of much greater experience than myself and left it to him to decide whether to give up my treatment. He preferred to continue. The other patient was not given any more of the vaccine. My patient recovered; the other eventually died. To my idea, the intense reaction to an overdose was a proof of the specific action of the vaccine and also a warning of the necessity for great care in deciding on the initial dose.

I want to lay special stress on the absolute importance of the preliminary desiccation of the nodule. I confess that my original idea in desiccating the nodule was not to increase its therapeutic value, but to facilitate the process of grinding. In my inexperience I thought I could pound such a nodule into a powder. This was found impossible, and desiccation added considerable difficulty to making the emulsion.

After hearing at the Royal Society of Medicine of the failure of such authorities as Sir A. E. Wright and Professor Castellani, I naturally wondered why I had been so much more successful. I concluded that it might have been because desiccation had damaged the fatty sheath of the bacilli, and so had liberated some active substance imprisoned.

To test this, I took another acid-fast bacillus of which it was possible to obtain a pure culture, i. e., the tubercle bacillus. I placed in a desiccator a definite weight of dead tubercle bacilli (already rather dry), and kept it there for four weeks. I then weighed out from the same stock the same weight of bacilli as that I had placed in the desiccator. I placed each in a test tube and poured on each the same quantity of ether. I shook them up and left them a few days, shaking occasionally. The result was that the ether over the desiccated bacilli was orange-yellow and that over the undesiccated bacilli almost colorless. Want of time and failing health prevented my making further experiments, but this satisfied me that desiccation enabled some ether-soluble substance to be removed from the bacilli. Shortly afterward I had another nodular case which supported the view I held regarding the importance of the desiccation.

CASE 2.—The patient had been treated by means of a vaccine made from a nodule, also by injections of sodium morrhuate and other such treatments, during which the disease became rapidly worse; new nodules were constantly erupting, and all the symptoms were increasing. She then came under my treatment.

I found large crops of nodules on the limbs and also on the trunk and some large nodules on the face. The patient was much distressed at the facial disfigurement and wanted me to excise all the nodules on the face. I explained to her that scarring would be marked after such treatment, but that I would remove one to make the vaccine, and hoped that under its effects the others would disappear and leave no trace. She assented. While making the new vaccine, I used some of my old stock; she improved at once, but the improvement was far greater

when I used the new vaccine. Rapid involution of the nodules followed, and the patient was satisfied with the cosmetic effect on the face. Dr. Muir at this time saw the treatment; he advised that I should treat the patient also with antisyphilitic remedies, as her blood before treatment gave a positive Wassermann reaction. In the meanwhile, however, I found that the reaction had become negative; so I simply added to my treatment infiltrating injections of hynocarpus oil, after I had satisfied myself that the vaccine not only had stopped the progressing disease but was rapidly causing its involution.

The patient had to leave the hospital, but Dr. Colebrook of the inoculation department of St. Mary's Hospital continued the treatment with my vaccine. He expressed his great satisfaction at the remarkable way in which the patient responded to the vaccine after a failure to respond to other treatments.

BRIEF REPORT OF OTHER CASES

I append brief notes on other cases under observation for a short time:

1. A woman more than 80 years of age with extensive nodular leprosy made marked progress in a few months under treatment with my vaccine. All of the nodules were involuting when, unfortunately, she fell a victim to a prevailing epidemic of influenza and died of pneumonia.

2. The patient had a bad case of mixed conditions, mainly nerve leprosy. When he was first seen, both eyes were completely disorganized and both hands and feet nearly gone. He had no money and was dependent on a small allowance given by his brothers. I started the treatment; the nodules began to involute, more slowly than in the typical nodular case, but so distinctly that I told the patient he was getting better, and that I expected to cure him. He said, "But, doctor, I cannot see yet." I had to tell him that his sight could never be restored. He then said that he did not wish his life prolonged and refused further treatment. He died about a year later.

3. In another case, that of a boy with typical nerve leprosy without nodules, there was slight improvement in the way of reduction of the size of the anesthetic areas following a short period of treatment, but the improvement was slow. The patient passed out of my hands.

Despite the small number of cases, the results of treatment with an emulsion of a desiccated nodule are so striking that I hope it may be tested in the United States and its dependencies. It would be a great pleasure to me, now that I have retired from active practice and have regained my full health, to help this work in any way.

Biography

ÉMILE VIDAL

B. BARKER BEESON, M.D.
CHICAGO

Émile Vidal, who was one of the outstanding dermatologists of his day, was born in Paris on June 18, 1825. After receiving his preliminary education at the Lycée Condorcet, in Paris, he moved to Tours with his parents. At that time the medical school of Tours was very much sought after, owing to the renown of Bretonneau and his two best known pupils, Trousseau and Velpeau. Vidal began his medical studies there, but later returned to Paris, where they were completed. In 1848, he was an extern in the hospitals, and two years later an intern. He received the medical degree in 1855, submitting a thesis entitled "Considerations on Chronic Progressive Articular Rheumatism." In his splendid obituary of Vidal, Brocq remarked that this thesis was an important document, since it contained the original description of a special deformity of the fingers which the author had christened "the atrophic fingers." For a time Vidal was much interested in general medicine as well as in pediatrics. In 1861, he secured an appointment as physician to the Hospitals of Paris, and six years later he was a chief of service at the well known Hospital Saint-Louis, where his career really began, and where he remained for twenty-five years. During the early part of his career, Vidal, like Besnier, was not ashamed to attend assiduously the clinics of his older colleagues, among them, Bazin, Hardy and Lailler. It was only after several years of such an apprenticeship that he began the series of articles which brought him renown. In 1860, he had tried for professeur ogrégé in medicine but was unsuccessful, owing largely, Brocq said, to his lack of a strong supporter in the Paris medical faculty. The thesis which he submitted dealt with congenital syphilis, and it was in advance of the times. This failure was a rather hard blow to Vidal, but he did not let it discourage him.

He was intensely interested in public hygiene, and was the first to suggest to the Medical Society of the Hospitals of Paris (1864) the isolation of patients suffering from contagious disorders, particularly smallpox. In 1870, Vidal urged the abolition of the maternity wards and delivery rooms in the general hospitals, and in their stead he advocated the establishment of an obstetrical policlinic. Vidal also urged a more efficient disposal of the sewage of Paris.

Although essentially a dermatologist, he wrote on other themes. In 1856, he contributed an article on splenic leukocythemia; in 1872, before the Academy of Medicine, he described the treatment of gonorrhea in both sexes by the balsam of Gurjun. The Academy of Medicine awarded him a prize in 1880 for an article dealing with the treatment of rectal prolapse by injections of ergotine. Other nondermatological subjects treated by him included the use of small intermittent doses of mercury in syphilis of the upper respiratory tract, the possibility of syphilis following a nonindurated chancre, the destruction of chancroids and phagedemic chancres with pyrogallol, sporadic, pellagra and acrodynia.

Vidal's subjects of predilection were the lichens and lupus vulgaris, but he was also a pioneer in demonstrating the inoculability of certain dermatoses as well as in the inauguration of a number of therapeutic measures. Brocq said that Vidal was at first opposed to the idea that lupus vulgaris was a form of cutaneous tuberculosis, but when the truth of this theory was demonstrated to him he became one of its most ardent defenders. It was said that for a time he believed in the identity of lupus vulgaris and lupus erythematosus.

Among his numerous publications, the following subjects were dealt with: sclerous and papillomatous lupus, in collaboration with Leloir (1882); erythemato-tuberculous lupus, with Leloir (1873), facial erysipelas in scrofulous subjects usually favorable as to prognosis (1874); generalized exfoliative dermatitis (1875) (the starting point of later French works, as Brocq's thesis in 1882); the spontaneous cure by resolution or by ulceration of the tumors in generalized idiopathic sarcoma of the skin; researches on the inoculability of certain dermatoses, among them impetigo, herpes, ecthyma and epidemic pemphigus of the new-born (1877); studies on the comparative temperature of normal and diseased skin (1877), and the nonheredity of lupus. In 1889, Vidal presented a paper on lichen at the Paris International Dermatological Congress, and three years later at the International Dermatological Congress, which took place at Vienna, he spoke about the prurigo of Hebra. He described lichen simplex about 1886, and as Darier has remarked in his Précis de dermatologie, it is still often referred to as lichen Vidal. Vidal believed, according to Brocq, that pityriasis was not a special entity even before Unna. In his opinion pityriasis of the scalp was merely an attenuated form of eczema in arthritic patients. Vidal and Brocq described the tumeurs d'emblée type of mycosis fungoides. Vidal demonstrated a classic leprosy in a man who had always lived close to Paris. He was among the first to preach its contagiousness.

In the realm of therapeutics, his contributions were many as well as useful. Among the subjects were: treatment of herpes progenitalis by

the local application of glycerite of tannin; treatment of erysipelas by the application of flexible collodion to the border; treatment of skin cancer by curettage followed by the local use of potassium chlorate, either in powder or solution; use of chaulmoogra oil in leprosy; use of liquid vesicants in alopecia areata, and treatment of chronic urticaria with quinine salts. Vidal was a pioneer in the use of linear scarification which he employed in lupus vulgaris, lupus erythematosus, acne rosacea, facial telangiectasia, oily seborrhea, sycosis, keloid and in rebellious localized pruritus. Brocq said that he often treated from sixty to eighty patients in this way every Thursday morning.

In the use of plasters for skin disorders Vidal is credited with antedating Unna. He treated patients with ecthyma and scrofulous ulcers with a red plaster composed of lead oxide, 2.5 Gm.; mercury sulphide, 1.5 Gm., and diachylon plaster, 26 Gm. In eczema, he employed a lime plaster or else a so-called white plaster with the following ingredients; simple plaster, 600 Gm.; yellow wax, 300 Gm., and white oil, 600 Gm. Persons with Hebra's prurigo and lichen simplex were treated with a plaster which contained the following ingredients with a cod liver oil base: simple plaster made with cod liver oil, 600 Gm.; yellow wax, 250 Gm., and white oil, 350 Gm. In an obituary of Vidal, Hans von Hebra said that with his advent a new spirit for therapeutic measures came into the hospital.

Vidal was intensely interested in cutaneous pathology and wrote a number of papers along that line, most of them in collaboration with Henri Leloir. Among them were papers on the following subjects: pemphigus diutinus, molluscum contagiosum, epidemic pemphigus of the new-born, urticaria, lupus, alopecia areata, generalized exfoliative dermatitis, acne vulgaris and mycosis fungoides. It was the intention of Leloir and Vidal to write a comprehensive work on the symptomatology and the pathology of the various dermatoses. They had, in fact, begun this task and had even published the first four sections of the projected work when the death of Vidal and three years later of Leloir prevented the fulfillment of this pet project of Vidal's. Among the more important subjects which had been taken up were: actinomycosis, alopecia, atrophy, Oriental sore, anthrax, acne, keloid, exfoliative dermatitis, eczema, seborrhoic eczema, dermatoneuroses, dermatitis herpetiformis, erythema multiforme, erythema nodosum, artificial dermatoses, erythema induratum, erythema of pellagra, favus and leprosy. There were numerous colored plates made after drawings of the sections by the well known artist Karmanski. All in all this gave promise of being a most valuable contribution, and it is much to be regretted that it remained unfinished.

Under the title "acne rodens," Vidal described Boeck's acne necrotica. In his recent excellent monograph on the diseases of the

scalp, Sabouraud tells of Vidal's description in 1879 of mediothoracic pityriasis as a specific morbid entity under the appropriate title "circinate or marginate pityriasis," as Vidal thought that it belonged to the ringworm group. Later, he thought that it was an unusual type of tinea versicolor. Negative microscopic examinations caused the rejection on his part of both of these theories. Finally, believing that he had discovered in scrapings from this disorder a new parasite related to the ringworms which he baptized *Microsporon anomaeon* or *Microsporon dispar,* Vidal called this condition circinate and marginate pityriasis. As Brocq stated, since Vidal's observations were not confirmed, this is now largely of historic interest only.

From 1852 to 1859, he was most active in the Société Anatomique, and was its vice-president in 1858. Later, he was conspicuous in the Société de biologie and the Société médicale des hôpitaux de Paris, being president of the latter organization in 1885. Vidal has been generally credited with being the real founder of the Société française de dermatologie et de syphiligraphie, of which he was secretary-general for four years. Later, he was made its president but never officiated in that capacity owing to illness and an untimely death. Vidal was also for some time one of the directors of the *Annales de dermatologie et de syphiligraphie.*

Vidal possessed a striking personality, along with much charm and sympathy. He was fond of society and was very popular in the salons. According to Brocq, he spoke but little, and his manner was energetic as well as authoritative. Under this somewhat brusque exterior he had the best of hearts; he was almost a father to his pupils, and was much attached to his friends. He was greatly interested in the industrious, whose work he tried to facilitate, and on many occasions he even aided them in the struggle for an existence. Hans von Hebra emphasized his hospitality, industry and honesty and also his opposition to anything bordering on charlatanism. Hebra also referred to Vidal as a man, a teacher, a discoverer and a physician.

In a splendid obituary, Brocq stressed the diagnostic acumen of his teacher, and no one is better fitted to do so, since he was for some years the intimate associate of Vidal. He may be quoted in part as follows:

> The penetration of his mind was truly marvelous: he examined the patient with a vivacity and dexterity which was not soon forgotten, he left nothing unexplored, discovering the decisive point with an almost uncanny rapidity, he pronounced a word and the diagnosis was made. His pupils had on numerous occasions admired this almost infallible diagnostic ability. One felt himself to be in the presence of a born clinician. It was in the midst of his patients, surrounded by his pupils and visiting physicians, indefatigable, animated, excited by his successes, that one should see him, follow and observe him, in order to understand the worth of such a man, his devotion to science, his ardor in relieving those who entrusted themselves to his care.

Despite an apparently robust physique, Vidal suffered much from disease. He died on June 16, 1893, after more than three months of illness. This sketch may be appropriately closed with the following words of Hans von Hebra, in his obituary dedicated to Vidal: "Rest peacefully, dear friend. Your memory will not be lost to us or to science."

Correspondence

PIGMENTED ATROPHIC SCLERODERMA

To the Editor:—The article on "Lichen Sclerosus et Atrophicus and Related Cutaneous Atrophies," by Dr. R. Nomland, which appeared in the April, 1930, issue of the ARCHIVES (vol. 21, p. 575), interested me greatly, especially because I am still unable to make up my mind as to the proper classification of certain dermatoses, examples of which I encounter at rare intervals.

In several papers (MacKee, George M., and Wise, Fred: White Spot Disease, *J. Cutan. Dis.* **32**:629 [Sept.] 1914. Wise, Fred, and Rosen, I.: Further Observations on So-Called White Spot Disease or Scleroderma Circumscripta, *J. Cutan. Dis.* **35**:66 [Feb.] 1917. Wise, Fred, and Shelmire, B.: Chronic Atrophie Lichenoid Dermatitis [Csillag], ARCH. DERMAT. & SYPH. **18**:179 [Aug.] 1928) in which I collaborated with MacKee, Rosen and Shelmire, we attempted to make a clinical and histologic classification of the various atrophying eruptions with which Dr. Nomland deals in his paper, arriving at approximately the same conclusions as he offers.

In connection with certain dermatoses belonging to this group, which do not lend themselves readily to identification and classification, I wish to call attention to an article published by M. Per (Note relative à un cas de sclérodermie superficielle circonscrite en plaques [variété dyschromique et atrophique d'emblée] où l'attention est tout particulièrement portée sur la clinique et l'étiologie, *Acta derm.-venereol.* **9**:155, 1928).

Per described a case in a man, aged 32, in which the dermatosis does not correspond to the classic picture of circumscribed scleroderma, but rather to the relatively rare forms which the French writers have designated as dyschromic-atrophic variants of scleroderma; in these types the superficial sclerosing process assumes the stages of atrophy in a remarkably short space of time, this clinical observation inducing Tenneson to name the dermatosis "sclerodermie atrophique d'emblée." Other authors have called it "morphoea plana atrophica." In the opinion of Brocq, Jeanselme and Thibièrge, this variety of scleroderma forms a connecting link between circumscribed scleroderma and circumscribed atrophia cutis.

Such borderline cases as Per described are encountered two or three times a year in most large clinics, and I think that the name "morphoea plana atrophica" is best adapted to this variety of pigmented, atrophic scleroderma.

FRED WISE, M.D., New York.

Abstracts from Current Literature

HEAT AND EFFORT SENSITIVENESS, COLD SENSITIVENESS: RELATIONSHIP TO HEAT PROSTRATION, EFFORT SYNDROME, ASTHMA, URTICARIA, DERMATOSES, NONINFECTIOUS CORYZA AND INFECTIONS. W. W. DUKE, Arch. Int. Med. **45**:206 (Feb.) 1930.

Duke believes that some disorder of the heat regulating mechanism is responsible for some of the common illnesses, including heat prostration, effort syndrome, asthma and urticaria, as well as miscellaneous diseases of the infectious type.

Heat production and loss are regulated by the coordinated action of many structures such as sense organs and certain cerebral centers, several hormones, histamine-like bodies, the skin, the mucous membrane of the nose and the bronchi, structures that control the secretion of moisture and those that control the respiration and rate of blood flow.

When this complicated mechanism becomes disordered, the result is an abnormal response to heat and cold, which response in turn may be inadequate to maintain a proper temperature. Allergic reactions to foreign substances may cause symptoms that may simulate those due to heat and cold.

In many persons who are sensitive to heat and cold reactions, there is an increased susceptibility to various infections.

Persons sensitive to heat should live in a dry cool climate and should avoid effort and overheating. The temperature of these patients should be kept from getting too low. An attack of fever often gives prolonged relief—an artificial fever can be aroused by the subcutaneous and intravenous use of colon bacilli. Improvement of noninfectious coryza, asthma, eczema and urticaria following injections of vaccines, peptone and milk may be due to elevation of the temperature.

Hot or cold baths may be used for heat and cold sensitiveness with varying degrees of success.

THE CONTROL OF IMMEDIATE SHOCK FOLLOWING HYPODERMIC MEDICATION. STANLEY W. INSLEY, J. A. M. A. **94**:765 (March 15) 1930.

A very simple device has been used by the author to control effectively allergic shock following hypodermic medication. The method consists merely in applying a blood pressure cuff proximal to the point of injection, and at the first sign of reaction, pressure is applied sufficient to cut off the venous return and the lymphatic seepage. The procedure used as a routine measure, utilizing a pressure of from 100 to 120 mm. of mercury has worked out satisfactorily. The pressure can then be lowered gradually to allow a proper rate of absorption. Relief follows in from thirty to sixty seconds. The use of epinephrine and ephedrine has not been discarded. The author uses the drugs with the cuff method—in fact, one patient who reacted violently to an injection of epinephrine was relieved by the application of pressure to the cuff. The method can be used for the control of absorption in all pollen, animal emanation, specific protein and serum inoculations. The idea is not new; it has been used in experimental work in anaphylaxis on animals. The use of a tourniquet had previously been suggested by R. A. Cooke (*J. Immunol.* **7**:119 [March] 1922), but the author is apparently the first worker to give the method an extensive clinical trial. He has even used this method of controlling absorption, for the purpose of obtaining a more rapid desensitization.

NEW METHOD OF ADMINISTERING POLLEN EXTRACT FOR PURPOSE OF PREVENTING REACTIONS: A SUBCUTICULAR METHOD. W. W. DUKE, J. A. M. A. **94**:767 (March 15) 1930.

The author controls reactions from pollen therapy by guiding the rate of dissemination of the pollen from the site of inoculation by the use of a tourniquet

above the point of inoculation, by the admixture of epinephrine and ephedrine with the pollen solution, by the use of a given standard of volume for solutions injected and by the avoidance of intravenous injection through the use of a subcuticular method.

CRITICAL TREATMENT PROBLEMS IN TODAY'S SYPHILOLOGY. JOHN H. STOKES, J. A. M. A. **94**:1029 (April 5) 1930.

The paper deals with four phases of the question, namely, the control of infectiousness by organized and socialized treatment, the problem of bismuth, the prevention and control of cardiac disease and neurosyphilis and smoother treatment. Concerning the control of venereal disease, the Europeans, the Scandinavians in particular, have proved that successful control is unmistakably tending toward organization. This does not necessarily imply mechanistic routinization or law-enforced compulsion. Methods can be found to suit the needs and ideals of American life, and against the day when the public shall call American medicine to account for its shortcomings, or private corporate enterprise shall control the field of venereal disease, physicians should encourage and use university clinics. They should spend more time with their syphilitic patients and explain their methods and objectives, for an intelligent talk makes for cooperation, which is essential. Of course, the physician should keep up to date on the therapy for syphilis by reading recognized journals, and not by depending on pharmaceutical detail men. Stokes aptly warns that indifference to modern knowledge spells the ultimate elimination of the private practitioner from this field. Finally, the physician should treat patients with early syphilis adequately. A detailed treatment plan for early syphilis is then outlined.

The author recommends that the physician select two or three good bismuth preparations and learn all about them. He recommends that the physician ignore the other preparations until an authoritative five year summary appears in the literature.

Fat-suspended potassium bismuth tartrate, salicylate or dextrose-suspended hydroxide or metallic bismuth are adequate. One who uses tryparsamide must use it continuously, not in broken doses, for two years before expecting to find serologic reversals of the reactions of the blood and spinal fluid. The combination of tryparsamide and of a nonspecific fever induced by typhoid-paratyphoid vaccine is simple and accessible and offers a formidable weapon in the treatment for neurosyphilis. The road of treatment can be smoothed by an irreproachable technic in the use of the agents available and a thorough application of the known principles governing their action and reaction in the patient.

RAYNAUD'S DISEASE ASSOCIATED WITH CHRONIC ARSENICAL RETENTION: REPORT OF A CASE CURED BY SODIUM THIOSULPHATE. ARTHUR F. KRAETZER, J. A. M. A. **94**:1035 (April 5) 1930.

There was complete disappearance of Raynaud's disease after treatment with sodium thiosulphate. There was a history of repeated exposure to insecticides that contained arsenic. Arsenic was demonstrated in the urine and there were the usual concomitants of chronic arsenical poisoning such as recurrent eczema, waxy pallor and garlic odor of the sweat. The investigation in this case was stimulated by the work of Throne and Myers on the relation of arsenical retention to the genesis of eczema.

EXPERIMENTAL CHROMIUM DERMATITIS. CAREY P. MCCORD, HOBART G. HIGGINBOTHAM and J. C. MCGUIRE, J. A. M. A. **94**:1043 (April 5) 1930.

The authors proved by experiments on thirty-seven volunteers that dermatitis can be produced by contact with solutions of chromic acid, potassium bichromate and ammonium bichromate, and that previous injury to the skin is not necessary,

thus destroying one of the hoary traditions of industrial hygiene. They produced a chromium dermatitis, and not chromium ulcers in which there is usually a break in the skin. The experiments are described in detail.

A Critical Survey of Charcot's Arthropathy. Udo J. Wile and Milton G. Butler, J. A. M. A. **94**:1053 (April 5) 1930.

From an analysis of twenty-eight cases, the following conclusions are drawn: The age at onset in the majority of cases was between 35 and 55, an observation that parallels the age period of the incidence of neurosyphilis. The onset was usually gradual and insidious, and when it was sudden it was usually the result of trauma. The arthropathy was found three times more frequently in men than in women, which compares with the incidence of tabes in the two sexes. Polyarticular involvement was common; all joints were involved, the knee and ankle most commonly. Neurosyphilis was usually present in the form of tabes. There were typical cases, however, without any evidence of cerebrospinal syphilis. The typical syndrome in the majority of cases seemed to be an inactive cerebrospinal syphilis, with few symptoms of syphilis being present. The ultimate etiologic factor is apparently the loss of afferent nerve paths to the joint, rendering it unable to compensate for injury.

The Continuous Bath Therapy of Hebra. Gustav Riehl, Jr., J. A. M. A. **94**:1058 (April 5) 1930.

Among the dermatologic entities for which this form of therapy is advised are pemphigus, psoriasis, decubitus, ulcers due to roentgen reactions and erysipelas when isolation can be instituted. The apparatus and form of therapy are described in detail.

Flax Hypersensitiveness. W. C. Black, J. A. M. A. **94**:1064 (April 5) 1930.

Two cases of giant urticaria are detailed in which the onset followed a breakfast of "Roman Meal," a cereal containing flax meal. Scratch tests with flaxseed gave positive results. In each case there was a history of previous contact with flaxseed in the form of poultices.

Xylene in the Treatment of Pediculosis. Charles Ferguson, J. A. M. A. **94**:1134 (April 12) 1930.

An effective preparation for the treatment for pediculi is 25 per cent xylene in a base consisting of equal parts of hydrous wool fat and petrolatum. It produces a mild warmth and tingling sensation for a few minutes that is relieved by rubbing. The ointment should be applied twice daily for five days. It is inexpensive, is cleaner than a mercurial ointment and causes no dermatitis.

Rattner, Chicago.

Syphilitic Reinoculations. L. Lortat-Jacob, J. Roberti and Poumeau-Delille, Ann. de dermat. et syph. **1**:2 (Jan.) 1930.

Under this title, the authors discuss the questions of pseudoreinfections, superinfections and reinfections in syphilis. Under pseudoreinfections, chancre redux and tertiary chancriform syphiloma are mentioned as sources of confusion. Chancre redux is an early manifestation; if Fournier's definition is followed, chancre redux occurs only early in the disease, within two or three weeks after the healing of the chancre.

It is improper to speak of superinfection in the primary stage. Reinoculations, however, are possible during the incubation and earliest period of syphilis. Superinfections are most frequent in the tertiary stage. The lesions of superinfection conform to the clinical stage of the disease.

Reinfection constitutes an important problem of syphilis, since it is the best indication of a cure of the disease. The authors discuss the well known rigorous criteria for substantiation of reinfection, but believe that some latitude from them may be allowed. Statistics on reinfection vary from one instance in 375 cases of syphilis (White) to one in 1,586 (Cedercrutz). The authors report seven personally observed cases of reinfection.

THE TREATMENT OF SYPHILIS WITH LIPOSOLUBLE BISMUTH COMPOUNDS. C. SIMON and J. BRALEZ, Ann. de dermat. et syph. **1**:20 (Jan.) 1930.

The liposoluble bismuth salts, according to Simon and Bralez, possess the advantages of both water-soluble and insoluble bismuth preparations. They have the rapid action of the first and the continued effect of the second. Again, they do not have the brusque action of water-soluble compounds, nor do they leave intramuscular centers. Furthermore, symptoms of intolerance, should they develop, disappear with greater rapidity than in the case of insoluble preparations. For these reasons, liposoluble bismuth compounds are superior to water-soluble or insoluble suspensions of the metal.

THE HERXHEIMER REACTION. BIZZOZERO, Ann. de dermat. et syph. **1**:44 (Jan.) 1930.

After discussing the various theories which have been advanced to explain the mechanism of the Herxheimer reaction, Bizzozero relates some personal research on the question. He has found that an intradermic injection of small quantities of indifferent liquids produce an accentuation not only of syphilitic roseola, but also of actinic erythema. This is a nonspecific action due to parasympathetic stimulation.

The mechanism of this reaction is different from that of the Herxheimer reaction because the latter appears in syphilitic roseola rubbed with mercury ointment. No reaction occurs in actinic erythema from mercury, thus showing that the influence of mercury on syphilitic exanthems is specific. Again it can be shown that the Herxheimer reaction is not a reaction of syphilitic tissue, but the result of an action on living spirochetes.

The reaction of Herxheimer is the result of the stimulation, and then death, of spirochetes. The Herxheimer reaction provoked by the arsphenamines is due to at least two factors; one specific (treponemicidal), the other nonspecific (vasodilator action).

LA TEIGNE AMIANTACÉE (ALIBERT). W. DUBREUILH, Ann. de dermat. et syph. **1**:61 (Jan.) 1930.

In a brief note, the author calls attention to a differential diagnostic point between this disease and psoriasis. In teigne amiantacée the hairs are encased in a corneous envelope which remains attached when the hair is extracted, while in psoriasis the epilated hair is free from scale. Sometimes, on the scalp, however, follicular psoriasis produces the same phenomena as teigne amiantacée. The follicular site explains the clinical feature of encasement of the hairs.

DERMATOSIS INDUSTRIALIS DUE TO COAL: THE PHOTODYNAMIC AND IRRITATIVE PROPERTIES OF SOME PRODUCTS OF COAL DISTILLATION. E. W. KISTIAKOWSKI, Ann. de dermat. et syph. **1**:63 (Jan.) 1930.

The article gives a detailed account of the author's observations which extended over a period of five years in an asphalt plant.

In this plant, asphalt was prepared by dry distillation. During the process, various fractions separated according to the temperature to which the treated mass was raised. The atmosphere in the plant was filled with fumes containing various chemical substances (anthracene, tar, etc.).

From the first day, the workers showed facial erythema and conjunctivitis. The erythema steadily increased in intensity, often to the point of exudation. In time, the exposed skin became infiltrated and pigmented. Severe pruritus was common. The symptoms were intensified by light. Little by little, the entire cutaneous surface was affected. Areas showing prominent comedones and acneiform lesions appeared. After the subject had been employed two or three months in this occupation, the skin exhibited characteristic features. All workers were affected.

The disorder was due chiefly to photodynamic and fluorescent substances in acridine, anthracene and phenanthrene, though mechanical and physical factors played a rôle.

Cancer in tar workers is known, but the author has seen none so far, probably because the plant which he studied had been in existence for only five years, and the personnel had changed frequently.

Coexistence of Lymphogranuloma Inguinale (Nicolas-Favre) and Primary and Secondary Syphilitic Adenitis. G. Petges, P. Lecoulant and P. Delas, Ann. de dermat. et syph. **1**:81 (Jan.) 1930.

The authors report a case in which the patient had the typical adenitis (inguinal and iliac) of lymphogranuloma inguinale. A phimosis, which prevented examination of the preputial sac, was present. While the patient was under treatment for this disease, symptoms of secondary syphilis appeared. Both disorders responded to appropriate measures.

Since the double infection undoubtedly came from the same source, the case furnished proof of the venereal origin of lymphogranuloma inguinale.

The Russian Treatment of Scabies. R. Huerre, Ann. de dermat. et syph. **1**:85 (Jan.) 1930.

The author, a pharmacist, discusses a treatment for scabies recently reported in a Russian journal. The treatment consists of the application of a solution of sodium hyposulphite followed by one of hydrochloric acid (2.5 per cent). Huerre thinks that greater quantities of the hydrochloric acid solution than are called for in the original article should be used, and even then, there is some doubt of the efficacy of the treatment, since only a small quantity of free sulphur will be formed.

Michael, Houston, Texas.

Duhring's Disease in an Infant, Therapeutic Considerations. P. L. Drouet, Bull. Soc. franç. de dermat. et syph. (Réunion dermat.) **37**:1 (Jan.) 1930.

Drouet's patient was 15 months of age. The eruption was erythematous and bullous. His treatment, which was followed by disappearance of the eruption, consisted in the subcutaneous injection of 1 cc. of the bullous contents. Five injections on alternate days were required.

Giant Lichenification and Buccal Lichen Planus. Sorlat and Drouet, Bull. Soc. franç. de dermat. et syph. (Réunion dermat.) **37**:4 (Jan.) 1930.

The patient had a large lichenified plaque on the left thigh and buccal lichen planus. The case was interesting because of the coexistence of these lesions.

Intradermal Reactions to Arsphenamine in Subjects Who Have Had Arsphenamine Dermatitis. G. Garnier, Bull. Soc. franç. de dermat. et syph. **37**:92 (Jan.) 1930.

Garnier employed 0.1 cc. of a 1:100 solution. Of twenty-one patients, all showed frankly positive reactions, and the increased sensitivity was elicited as late as two years after the dermatitis. The reaction was negative in twenty-five control patients, while only one of eleven patients who had a ninth day erythema (Milian) reacted positively.

MYXEDEMA TUBEROSUM (JADASSOHN-DOESSEKER) CURED BY THYROID EXTRACT. GOUGEROT and O. ELIASCHEFF, Bull. Soc. franç. de dermat. et syph. **37**:108 (Jan.) 1930.

This is the first case of the condition reported in France, and it was typical. Response to thyroid therapy was prompt.

OMPHALITIS DUE TO VINCENT'S ORGANISMS. GOUGEROT and P. BLUM, Bull. Soc. franç. de dermat. et syph. **37**:113 (Jan.) 1930.

The authors report a case of this disorder in which Vincent's organisms were found. The secretion was greenish and abundant. The condition yielded rapidly to local applications of neoarsphenamine.

A CASE OF ARTERIAL EMBOLISM FOLLOWING AN INTRAMUSCULAR INJECTION OF OIL-SOLUBLE BISMUTH. JOULIA, Bull. Soc. franç. de dermat. et syph. **37**:118 (Jan.) 1930.

Joulia has seen two other cases of this type due to insoluble bismuth compounds, but the present case appears to be the first reported in which an oil-soluble preparation was responsible. The clinical picture was similar to that following an intra-arterial injection of insoluble compounds of mercury or bismuth. The case is important because it shows that an oil-soluble bismuth preparation can produce this condition. Joulia has been able to produce gangrene of the ear in rabbits by injecting into the median artery insoluble, oil-soluble and even water-soluble bismuth preparations.

A CLINICAL AND BACTERIOLOGIC STUDY OF AN UNUSUAL FORM OF CUTANEOUS GANGRENE. A. SÉZARY, P. LEFÈVRE and G. LÉVY, Bull. Soc. franç. de dermat. et syph. **37**:124 (Jan.) 1930.

The lesion presented by this patient was situated on the left breast. When seen, it had been present for three weeks. It suggested anthrax. The lesion was incised. Bacteriologic examination showed that it was due to a gram-negative organism belonging to the colon group.

PATHOLOGIC TYPES OF RECKLINGHAUSEN'S DISEASE. F. CAILLIAU, Bull. Soc. franç. de dermat. et syph. **37**:128 (Jan.) 1930.

The investigations of Cailliau show that the anatomic substratum of this disease is not of a single type. He has encountered tumors of the type of simple peripheral gliomas and others showing the structure of central gliomas or fibromas, also of both medullated and nonmedullated neuromas. Certain tumors, especially early ones, show a vascular element not unlike that of Kaposi's sarcoma.

INTRADERMAL HEMOLYSOTHERAPY IN THE TREATMENT OF SOME DERMATOSES: ECZEMAS, ECZEMATIFORM DERMATITIS AND PRURITUS. R. J. WEISSENBACH and D. RONGET, Bull. Soc. franç. de dermat. et syph. **37**:131 (Jan.) 1930.

The authors give the name intradermal hemolysotherapy to a method that consists in the intradermal injection of small quantities of laked blood, repeated daily for variable periods of time. The blood may be that of an animal, of another person or of the patient himself. In the cases reported in this article the total blood of the patient was laked with ether (autohemolysotherapy). The hypotheses on which the method is based are only touched on.

Nineteen cases are briefly recorded comprising endogenous and exogenous eczemas and pruritus with lichenification. All had proved recalcitrant to earlier treatment. Nine patients were cured, four obtained decided improvement, four suffered recurrence after apparent cure, and one failed to obtain relief.

The method is a type of hemotherapy that possesses certain advantages.

THE ETIOLOGY OF CUTANEOUS LESIONS APPEARING AT A DISTANCE FROM PYODERMIC FOCI, STAPHYLOTOXIDS AND STREPTOTOXIDS. M. KITCHEVATZ, Bull. Soc. franç. de dermat. et syph. **37**:139 (Jan.) 1930.

Kitchevatz records investigations in cases beginning in isolated pyodermic foci and developing disseminated lesions, usually erythematous patches. He found a pronounced allergic reaction to intradermal injections of diluted staphylotoxins and streptotoxins. The site of inoculation often showed reactions corresponding to the spontaneous disseminated patches. Hence, he concludes that these cases are analogous to trichophytids and other fungus allergic manifestations.

(These cases are known in this country as infectious eczematoid dermatitis [Engman]. An allergic element was thought to play a part in their genesis; the above report, however, seems to be the first experimental demonstration of this assumption. J.C.M.)

MICHAEL, Houston, Texas.

DERMATOLOGIC ABSTRACTS

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

UNDETECTED SYPHILIS AND RHEUMATIC INFECTION IN CHILDHOOD. A. D. FORDYCE, Brit. M. J. **1**:530 (March 22) 1930.

Nine cases of rheumatic infection in congenital syphilitic children are described by Fordyce; in six of the nine cases there were no obvious signs of congenital syphilis. It is suggested that undetected syphilis may in some cases form a basis for the serious course of rheumatic infection, and, further, that the study of rheumatism may be aided by the grouping of rheumatic cases along nonrheumatic lines.

SPONTANEOUS GANGRENE OF EXTREMITIES IN YOUNG ADULTS. A. STAPF, Arch. f. klin. Chir. **158**:297 (March 5) 1930.

Juvenile, thrombosing angiosclerosis of the extremities is the term proposed by Stapf. No single cause can be assigned for the condition, but he is convinced that there must be an underlying constitutional weakness of the circulatory system. A racial factor can no longer be accepted as a cause, because many races now are found to be affected. He reviews all assigned causes, but cannot agree to the acceptance of any one of them as being of sufficient etiologic importance to be recognized as the exciting factor in the production of this disease.

PELLAGRA IN CHILD: CASE. W. LENGSFELD, Jahrb. f. Kinderh. **127**:69 (March) 1930.

Lengsfeld reports a typical case of pellagra in a child, aged 6, who was born and raised in Silesia. The child had never eaten corn but had been on an extremely low protein diet for a long time. As a sign of a concurrent avitaminosis, a keratomalacia developed. Under dietetic treatment the cachectic condition of the patient improved.

ROENTGEN THERAPY OF ACTINOMYCOSIS OF FEMALE GENITALIA. H. MARTIUS, München. med. Wchnschr. **77**:392 (March 7) 1930.

Martius describes a woman, aged 54, whose condition had been diagnosed as a malignant growth in the abdominal cavity. An operation with subsequent microscopic examination of the specimen revealed *Actinomyces*, and the case was diagnosed as genital actinomycosis. Roentgen treatment was instituted. The author describes the technic of the treatment, which was given in three series. During the first series of roentgen treatments, the woman was given intravenous injections of iodo-oxybenzene pyridine sulphonate. During the five week interval between

the first and second series of the radiation treatments, the patient was given potassium iodide. A third series of roentgen treatments was given several months later. An examination about one year after the beginning of the treatment revealed that the actinomycosis had completely disappeared. The author thinks that the recovery was mainly due to the effects of the roentgen therapy. He emphasizes that only small doses should be given.

CLINICAL ASPECTS OF ACTINOMYCOSIS OF FEMALE GENITALIA. P. SCHUGT, München. med. Wchnschr. **77**:394 (March 7) 1930.

According to Schugt, *Actinomyces* produces in the human organism inflammatory granulation tissue that, by its disintegration, destroys normal tissues. This pathologic process has almost malignant characteristics. The author points out that *Actinomyces* sometimes affects the female genitalia. The diagnosis is based on the bacteriologic demonstration of *Actinomyces*. However, *Actinomyces* may exist even if the bacteriologic examination gives negative results. The author states that an actinomycosis should be considered possible in cases of inflammatory disorders of the genitalia in which the process is progressive in spite of conservative or surgical treatments. Cases of actinomycosis of the female genitalia that are reported in the literature indicate that the prognosis is usually unfavorable. Concerning the therapy, the author states that unless the correct diagnosis is made early, the surgical treatment is not successful. Of the various medicinal treatments the author mentions the oral administration of potassium iodide and the local application of tincture of iodine, copper sulphate or corrosive mercuric chloride. Protein therapy, and vaccine therapy as well as hydrotherapeutic measures have also been employed. However, the results of these treatments were not entirely satisfactory. Roentgen therapy has proved effective in some instances. The author gives a detailed report of one case. The cause of the infection could not be definitely determined. It is assumed that it began after an abortion or that the genital infection was secondary and was caused by a primary infection of the gastro-intestinal tract. Various therapeutic methods were employed, and it appears that the administration of small doses of roentgen rays brought the most favorable results. The author points out, however, that if roentgen treatment is employed, it cannot always be definitely stated what is due to its influence and what is spontaneous recovery. It should also be considered that in women during the childbearing period, roentgen therapy of the genitalia is contraindicated on account of injurious effects on the offspring.

CHANGES IN THE BLOOD DURING ADMINISTRATION OF ULTRAVIOLET RAYS. P. V. NETCHAEVA, Kazansky M. J. (Kazan) **26**:143 (Feb.) 1930.

Netchaeva asserts that when children with peritonitis, rickets, anemia, tetany, spondylitis and other diseases common to childhood were exposed to ultraviolet rays there was a marked increase in hemoglobin and in the number of erythrocytes and leukocytes. The eosinophils especially were increased.

Society Transactions

SAN FRANCISCO DERMATOLOGICAL SOCIETY

H. J. Templeton, M.D., *Secretary*

September, 1929

Ernest Chipman, M.D., *Chairman*

Urticaria Bullosa. Presented by Dr. S. Light for Dr. S. C. Way.

N. M., a man, aged 27, a tinsmith, entered the Stanford Clinic on Sept. 4, 1929, complaining of a vesicular and bullous wheal-like eruption on the body which was intensely pruritic. The lesions first appeared during the second day after his arrival in San Francisco about three weeks previous to examination. Since that time new lesions have appeared continuously, but they have seldom remained more than four days. There has never been any previous skin trouble, and his general health has always been good.

DISCUSSION

Dr. M. T. Maynard: This is an example of flea urticaria, but the severity of the reaction is somewhat unusual. We see it more commonly in infants than in adults. The change of lodging and clothing could not be expected to have made a difference, as he may have changed to as bad a place as he was in formerly.

Dr. S. C. Way: When the patient was first seen it was impossible to demonstrate puncta in any of the vesicular wheal-like lesions, some of which were large and resembled bullae. However, it is probably an urticaria of insect origin.

Dr. Ernest Chipman: These are, no doubt, flea bites. Although they are symmetrically arranged, the flea in its peregrinations may have followed the creases in the clothing.

Dr. H. J. Templeton: I saw a similar case of flea urticaria in September at the University of California Infirmary with bullae as large as one's thumb nail. This constituted the most violent reaction to flea bites I have ever seen. A large percentage of newcomers to the San Francisco Bay region are attacked by "hives" immediately on their arrival. Such urticarias are almost always due to flea bites. Some of the lesions are actually bites and can be recognized by the presence of a central punctum. Urticarial lesions also develop at sites remote from the bites. These secondary lesions are not bites but are true urticaria probably resulting from a sensitization to the hemolytic substance injected by the flea.

Dr. H. Morrow: The diagnosis is probably urticaria. It is not unusual to have bullae in severe types. It is interesting to note that the eruption was symmetrical, and the lesions were on the hips and inside the arms. The diagnosis is urticaria, but probably not due to flea bites.

Dr. Ernest Chipman: I think you may possibly explain that by the fact that the flea goes to the part of the body where the clothes are nearest the skin. He does that on each side of the body.

Coccidioidal Granuloma. Presented by Dr. M. T. Maynard.

Mr. P. G. gave a history of having suffered an injury on the dusty crank case of a car that had recently been used in the San Joaquin valley. One month previous to examination lesions developed at the site of the injury on the dorsum

of the left hand. He was treated for three weeks with compresses, with no healing and rapid extension.

When first seen by me the lesion was granulomatous, presenting a large semicircular ulcer with undermining of the edges and secondary craters rapidly forming peripherally. Smears at that time showed occasional double contoured bodies with one greenish yellow body, packed with small spores and a faintly prickly outline.

A diagnosis of coccidioidal granuloma was made. Colloidal copper was given intramuscularly, also *Coccidioides* vaccine, but no improvement was noted after three weeks of treatment. Tartar emetic in 5 cc. doses of a 1 per cent solution was given intravenously. Rapid healing was apparent within two days. In five weeks the lesion was entirely healed, and there has been no recurrence to date.

DISCUSSION

DR. H. MORROW: Before getting positive cultures from these cases one should hesitate to make a diagnosis. Fresh cultures are characteristic. I think that it would be a mistake to present the case as *Coccidioides* infection without full cultures.

DR. M. T. MAYNARD: Cultures are negative thus far and smears indefinite.

DR. H. E. MILLER: I should like to emphasize what has been stated before about finding *Coccidioides* in smears. We have been able to demonstrate them in the few cases that we have had as long as there was a drop of pus remaining. I think we cannot diagnose a case of coccidioidal granuloma without positive smears, cultures or animal inoculations.

DR. H. E. ALDERSON: I agree with what the speakers have already said about the importance of having cultures and positive animal inoculations, but I think it might be well to keep on trying to find organisms before concluding that this is not coccidioidal granuloma. Try animal inoculations. Maybe we can see the patient at the next meeting.

DR. M. T. MAYNARD: I think we will find the condition completely healed.

DR. G. D. CULVER: My only impression is a clinical one. The clinical appearance and rapidity at which the condition is healing would give me the impression that the lesions are infections from a pyogenic organism.

DR. M. T. MAYNARD: I have never seen a pyogenic granuloma that has behaved just as this has. It is situated deeply in the skin, and the poor result of treatment is suggestive. For a month before I had the case the patient was treated with daily compresses and swabbed with iodine, mercurochrome, etc., without success. It is hard to understand why the staphylococcus which usually causes the pyogenic granulomas should not have been more easily controlled than this.

DERMATITIS HERPETIFORMIS. Presented by DR. H. J. TEMPLETON.

J. S. B., a man, aged 32, was first seen in July, 1928. He presented a number of blebs and papules the size of a split pea on his forehead and bearded region associated with violet pruritus. He alleged that he had had intermittent similar attacks since receiving "injection for the flu" in 1918. He was next seen in March, 1929, when I made a diagnosis of dermatitis herpetiformis, as blebs were present on the forehead and over the sacrum. The physical examination gave negative results. The eruption retrogressed under the influence of ultraviolet light. Blood counts, urinalysis and examinations of the stools were negative. At one time a mild eosinophilia was found. The patient was seen in another exacerbation in September, 1929, when vesicles were seen on the face. He is of a nervous temperament.

DISCUSSION

DR. H. E. ALDERSON: This patient was referred to me by the Veterans Bureau. He seems to be more worried over increasing his compensation granted

by the Bureau than anything else. When he called, he had no lesions that could be called dermatitis herpetiformis. Furthermore, all attacks that he described had involved only the face, scalp, buttocks and ankles. There was no pigmentation in any of these areas except the buttocks, and there it was slight and could easily have been secondary to repeated trauma. Tonight there are absolutely no lesions except a small vesicle in the flexure above the right ear. That is not diagnostic. Never at any time, as far as I can ascertain, has any one made a blood count or a differential cell count or taken fluid from a vesicle. This I shall do if the patient keeps his promise to come in when a new vesicle appears. I suspect that the man is a malingerer, but in view of a positive clinical diagnosis made by men who saw him in an attack, I shall defer judgment.

DR. L. R. TAUSSIG: He was at our office about a week ago and then presented lesions typical of dermatitis herpetiformis on his face, neck, hips and buttocks. There were a number of vesicles, and the grouping and itching made the diagnosis certain. I asked both Dr. Morrow and Dr. Miller to see him. I think they agreed with me on the diagnosis. I then asked him if he had seen any other dermatologist, and he said that he had been treated by two or three. He asked me what the diagnosis was, and when I told him, he said that was what Dr. Templeton had said. As far as making the diagnosis was concerned, any of our students could have made it at that particular time.

DR. H. MORROW: The patient does have relapses. I have seen him for about a year and thought that he had dermatitis herpetiformis.

DR. S. C. WAY: He told me that he was examined by several well known Chicago dermatologists when the trouble first appeared and that a diagnosis of urticaria had been made.

EXTENSIVE SCARS FROM ACNE. Presented by DR. M. T. MAYNARD.

This patient gives a history dating back four years, during which time he has had multiple granulomatous lesions everywhere on the skin of the body. He was treated by vaccine, x-rays, ultraviolet ray and various local applications. When first seen by me two months prior to presentation, he presented the picture of a generalized blastomycosis. A biopsy also gave the picture of blastomycosis except that no spores could be found. The lesions have to some extent responded to an ammoniated mercury ointment. All smears from the pus have been negative for fungi.

DISCUSSION

DR. S. C. WAY: The patient impresses me as one who has had acne, probably of the pustular type, for a good many years. I would classify it as a case of chronic acne, complicated by furunculosis.

DR. C. E. SCHOFF: I saw this man about six or seven years ago, and at the time I made a diagnosis of severe pustular acne. It was probably one of the worst cases I have ever seen, and at that time I suggested to him that we give roentgen therapy. There was some scarring at the time but not as bad as he has at present. It was a typical case at that time.

DR. G. D. CULVER: Is there any possibility that the man has been taking bromides?

DR. M. T. MAYNARD: He gave no such history.

DR. H. E. ALDERSON: When you put him on treatment with iodine, did any new lesions develop?

DR. M. J. MAYNARD: No.

TUBERCULIDS. Presented by DR. NORMAN EPSTEIN.

A man, aged 28, a Greek has had a recurrent eruption for the past three years. The lesions consist of groups of indolent papulopustules which are about 1 cm. in diameter and which involute spontaneously in a few weeks leaving a small

scar. The eruption is mainly on the extensor surface of the legs and arms with a patch over the sacral region and in the left lower portion of the abdomen. Biopsy showed a chronic inflammatory reaction without definite tubercles and giant cells, but the picture is suggestive of tuberculous inflammatory tissue.

DISCUSSION

DR. H. E. ALDERSON: The individual lesions look very much like tuberculids.

BAZIN'S DISEASE ASSOCIATED WITH A PRICKLE CELL EPITHELIOMA. Presented By DR. ERNEST K. STRATTON.

On both legs posteriorly, are several reddish, painless nodules, some of which have broken down and are exuding. Also there are several depressed pigmented scars in the same location, which are probably the remains of previous lesions. These have been present for several months. Last February and March the patient had several hemorrhages of the lung and following these, nodules appeared on both sclera, a biopsy of which showed tuberculous structure.

She also presents a different type of lesion on the mesial posterior aspect of the left knee. It is a thick, pigmented, fairly well circumscribed granulomatous appearing growth, with several small superficial ulcers, especially at its borders. It has been present seven years.

DISCUSSION

DR. L. R. TAUSSIG: Clinically the lesions on the leg are tuberculous.

DR. M. T. MAYNARD: I think that the lesion behind the knee is a hypertrophic lichen planus. Those on the leg suggest erythema induratum.

DR. ERNEST CHIPMAN: I saw only the erythema induratum lesion and the other was lost on me.

DR. H. J. TEMPLETON: I agree with the diagnosis of Dr. Maynard.

DR. S. C. WAY: The lesion in the popliteal space are those of hypertrophic lichen planus. This has already been brought out by Dr. Maynard and Dr. Templeton. We have had several of these cases recently, and they are resistant to treatment.

DR. E. K. STRATTON: The biopsy of the lesions on the leg, which are typical of erythema induratum, showed a tuberculous structure, but the lesion behind the knee showed a prickle cell epithelioma. I did not make the diagnosis of epithelioma before the biopsy was done, and I wanted to see if any one here recognized it as such.

LUPUS VULGARIS: LUPUS ERYTHEMATOSUS AND TUBERCULOUS DACTYLITIS IN THE SAME PATIENT. Presented by DR. E. REYES for DR. H. E. ALDERSON.

Mrs. R., aged 45, was first seen at the Stanford Skin Clinic on April 24, 1925. She presented typical lupus erythematosus on the nose and adjacent regions of the cheek; lupus vulgaris of the forearms and tuberculous dactylitis (severe) of the left middle finger. This finger was amputated later in the surgical clinic. All of these lesions had been present for three years. The patient's general condition was good. Roentgen examination of the lungs was negative for tuberculosis, and no foci were found elsewhere excepting in the finger where there was considerable destruction of bone by the tuberculous process. The Wassermann test was negative.

The patient was given eighty injections of old tuberculin without results. Next, she received sixteen intravenous injections of gold sodium thiosulphate starting with 0.10 Gm. and increasing to 0.25 Gm. weekly. After the twelfth injection, the skin was almost clear. When she had the eighteenth about one and one-half years prior to presentation, the skin was apparently normal. The patient did not return for treatment, and we did not see her again until this week. Now there is an active patch of lupus vulgaris present on the forearm.

DISCUSSION

DR. H. E. ALDERSON: The occurrence of three different manifestations of tuberculosis in this patient's skin makes it an interesting case. All of the lesions responded to the gold and tuberculin therapy two years previous to presentation, but now there is a recurrence, a typical patch of lupus vulgaris on the forearm.

DR. H. J. TEMPLETON: I saw the patient while working in the Stanford Skin Clinic several years ago. Dr. Leslie Smith, who is now in El Paso, Texas, and who was working at Stanford then treated this patient with tuberculin. Improvement was slow; so we placed her on treatment with gold sodium thiosulphate. Steady improvement followed.

DR. S. C. WAY: I think this case is merely an example of what gold will do and emphasizes the importance of long continued treatment. The patients in these cases improve for a while and are sometimes almost well when treatment is stopped by the patient, and this is followed by a recurrence of the original condition.

DR. H. MORROW: It seems to me an unusual and interesting case. Almost all types of cutaneous tuberculosis are present, the most typical tuberculid lesions being present on the arm.

MYCOSIS FUNGOIDES. Presented by DR. H. J. TEMPLETON.

Mrs. S., was presented before this society a year ago with a diagnosis, clinically, of mycosis fungoides. The histopathology was that of lymphoblastoma, the cells resembling those seen in lymphosarcoma. A huge fungating tumor anterior to the right ear disappeared rapidly following irradiation. Two months previous to presentation a new tumor appeared near the original one. It was treated two weeks ago with x-rays and has retrogressed about 50 per cent. The irradiation of the original lesion was given along with neoarsphenamine.

DR. H. E. ALDERSON: This case illustrates well what can be accomplished with the roentgen ray in granuloma fungoides.

VON RECKLINGHAUSEN'S DISEASE. Presented by DR. E. REYES for DR. H. E. ALDERSON.

This is a typical example of the condition. The patient, a man, aged 32, was in good physical condition except for facial paralysis of recent origin. His mentality appears to be normal. The lesions first appeared on the chest about four years before presentation, and others soon followed until the entire body from the neck down became thickly covered with lesions. The Wassermann reaction is four plus and the spinal fluid is negative.

DISCUSSION

DR. H. MORROW: I should like to say something regarding these cases. Frequently we tell such patients that they will never have any trouble and no treatment is necessary and then let them go. I think we should tell them to report in case of the lesions causing any trouble. I saw two such patients at the University of California Hospital treated for carcinoma and became interested and looked up the literature for the percentage of cases which developed into sarcoma and other types of malignant disease and found it to be high, about 30 per cent.

LUPUS ERYTHEMATOSUS. Presented by DR. H. J. TEMPLETON.

Mr. V., aged 39, had been in good health until six months previous to presentation at which time several abscessed teeth were extracted. Immediately afterward an eruption appeared anterior to his ear and gradually spread over the face and both ears. No further extension was noted until two weeks before presentation when, following excessive perspiration, new lesions appeared over the neck and sternal region. The lesions vary in size from that of a split pea to that of a

palm, and are sharply marginated, dry, slightly scaly plaques. A general physical examination was negative except for several more abscessed teeth. Blood counts, urinalyses and Wassermann tests were normal.

DISCUSSION

DR. ERNEST CHIPMAN: I was particularly interested in this man because of the onset of the infection that led to the eruption on the face and the fact that he had a red tongue and loss of papillae. If he does not respond to gold therapy, it would be interesting to try vaccine therapy.

DR. H. E. ALDERSON: A combination of injections of a gold compound and vaccine therapy might be worth while.

NOTE: Fifteen injections of gold sodium thiosulphate were given with no appreciable improvement. The remaining abscessed teeth were then extracted. Following this, the eruption spread over the whole body in the manner of exfoliative dermatitis. Further examinations disclosed no evidence of tuberculosis, but infected sinuses and tonsils were discovered. A streptococcus was recovered from an apical abscess, and an autogenous vaccine is now being given. This is being given daily in small doses intradermally in an attempt to desensitize the patient to the organisms found in his foci of infection. The generalized exfoliative dermatitis has disappeared, and the patient has returned to work showing about 90 per cent improvement. The treatment with vaccine is being continued.

SARCOID (?). Presented by DR. E. REYES for DR. S. C. WAY.

Mr. C., aged 44, entered the standard Clinic April 24, 1929, complaining of indurated, raised, purplish-red, pigmented areas on the lower left eyelid, dorsum of the hands, fingers, and on the lateral borders and soles of both feet. The first lesion appeared on the eyelid eighteen months prior to presentation. The Wassermann reaction was negative, and a complete blood count was normal. Before entering the clinic the patient had received twelve injections of neoarsphenamine and twelve of bismuth without visible improvement. Two biopsies were suggestive of sarcoid. Remarkable improvement occurred after sixteen injections of gold sodium thiosulphate. This case was shown at the meeting of the American Dermatological Association last July with a questionable diagnosis.

DISCUSSION

DR. D. W. MONTGOMERY: I think that it is Kaposi's sarcoma. The lesions on the heels and toes are characteristic. I understand the man comes from Greece.

DR. M. T. MAYNARD: When I first saw the man, I made a diagnosis of Kaposi's sarcoma.

DR. S. C. WAY: Histologic examination of the tissue failed to confirm the diagnosis of Kaposi's disease. Sarcoid was suggested. Dr. Reyes made several slides looking for Hansen's bacilli with negative results, and the histologic examination of the tissues did not show Hansen's bacilli.

DR. H. E. ALDERSON: Areas of anesthesia were noticed in the lesions on the hand.

DR. E. REYES: When I took the biopsy from the hands, the patient showed anesthesia without procaine hydrochloride.

DR. D. W. MONTGOMERY: I suggest that arsenic and x-rays be tried.

DR. S. C. WAY: The patient showed remarkable results after having the injections of a gold compound. We shall try x-rays and report at the next meeting.

LATER REPORT BY DR. S. C. WAY: A series of roentgen treatments given the lesions on the right foot failed to produce an improvement. Injections of gold sodium thiosulphate were again given at weekly intervals, and at the present

time all the lesions have improved to the extent that a brownish pigmentation of the skin is the only evidence of the disease remaining.

LEIOMYOMA. Presented by DR. H. E. MILLER.

A man, aged 58, presents seven firm tumors measuring from 1 to 4 cm. in length by from 0.5 to 1 cm. in width over the right scapular area with a few smaller areas over the left scapular region. They had been present since early adult life, were not enlarging and were a little darker in color than the normal skin and were slightly painful during cold weather. Microscopic examination of tissue removed showed the tumor to be composed of unstriped muscle with a few slightly enlarged blood vessels.

DISCUSSION

DR. H. MORROW: These cases are unusually rare. They have certain characteristics that I think can be recognized clinically. Dr. Miller made a diagnosis of leiomyoma before he saw the biopsy, and if we study the patient we can all do that. I have seen several such cases, one with Dr. Miller a year or so ago. There is one point that is apparently, that is, the rubbery consistency of the individual lesions. The distribution is also suggestive.

H. J. TEMPLETON, M.D., *Secretary*

Nov. 22, 1929

ERNEST CHIPMAN, M.D., *Chairman*

CHRONIC ERYTHEMA BULLOSUM (OR PEMPHIGUS?). Presented by DR. H. J. TEMPLETON.

Charles B., aged 6, was seen at the Baby Hospital in June, 1929, with a classic case of erythema multiforme showing ringed and polycyclic lesions. A few weeks previously, just prior to the onset of his trouble, he suffered from a severe attack of sore throat. He was given sodium salicylate by mouth. Within a few days the lesions which had formerly been merely wheals or erythematous plaques became bullae. These bullae rapidly became pustular and spread over the entire body. New bullae appeared on normal skin.

Blood cultures, blood counts, urinalyses and a Wassermann test showed nothing of interest. *Staphylococcus aureus* was cultured from the blebs and pustules. During the first month of the illness his temperature ranged from 101 to 104 F., but gradually diminished to normal. A general physical examination, including roentgenograms of the chest, disclosed no abnormalities. The tonsils were removed and the antrums washed, but the eruption failed to improve. Various types of treatment such as coagulin, iron cacodylate, tryparsamide, autogenous vaccines, bacteriophage, salicylates and tonsillectomy were tried without relief. When last observed, ten months from the date of onset, about 25 per cent of the original eruption remained and new blebs still appeared on normal skin.

DISCUSSION

DR. HIRAM MILLER: I had a similar patient in whom five months was required for recovery. I believe that the time element is more important than medication. I think that the name given this disease by Bowen many years ago is as good as any: "recurrent bullous eruption of childhood."

DR. HARRY ALDERSON: I think that Dr. Templeton is working in the right direction but I have never seen pemphigus in one so young. I could see no blebs arising from the healthy skin.

DR. STUART WAY: Had the child been vaccinated prior to the onset of the trouble?

DR. H. J. TEMPLETON: No.

DR. THOMAS CLARKE: I think that the sore throat was the etiologic factor that started the process and resulted in the multiforme condition. I would like to see baths continued, not necessarily bichloride but possibly tar or glycerin.

DR. E. K. STRATTON: I am inclined to agree with Dr. Templeton's classification. I noticed some bullae in the axillary regions which contained clear fluid and which seemed to constitute the primary type of lesion.

RINGWORM OF THE SCALP: THALLIUM ACETATE EPILATION. Presented by DR. H. J. TEMPLETON.

This baby was presented to stimulate the discussion of epilation brought about by the use of thallium acetate. I have treated thirty children by this method. The dose was given in accordance with the body weight (8 mg. per kilogram) after it was determined that the child was physically normal. Epilation began about three weeks after the drug had been given. Only one child of the thirty suffered any ill effects. In this one, fever, vomiting and pain in the joints occurred about five days after the drug was given but promptly disappeared. In three cases epilation failed to occur. The hair grew back very nicely and more quickly than with the roentgen method; in fact, after epilation occurs, one must work rapidly because the hair starts to grow back after about ten days. Some fatalities have been reported lately, but almost always after split repeated smaller doses.

DISCUSSION

DR. HARRY ALDERSON: In cases of thallium poisoning, destructive changes have been observed in some of the endocrine glands. It is believed that depilation is produced by some such action. I admire Dr. Templeton's courage. We are afraid to employ thallium on account of serious untoward results from its use reported in large numbers of cases in the European literature. Certainly it is dangerous around and after puberty.

DR. STUART WAY: I have seen a large number of cases of permanent alopecia result from its use, and for that reason I have been afraid to use the drug. In the European clinics where it has been used, an enormous number of cases of alopecia resulted which were permanent and which caused the method to be largely abandoned.

DR. E. K. STRATTON: I have used it and it has proved satisfactory. I have read that some one used one half of the usual dose of thallium and ½ skin unit of roentgen rays and reported success from this combination.

DR. H. J. TEMPLETON: I have used this method only on children less than 12 years of age and only on those who were of a normal age-weight ratio. If a child is governable and can be held quiet long enough to permit the use of roentgen rays, thallium probably should not be used. Its field of usefulness would seem to be in those children who cannot be controlled under roentgen therapy. In none of my cases did epilation of the eyebrows or eyelashes occur.

SEVERE ACNE. Presented by DR. H. C. COE.

This young man is presented because of the extreme degree of involvement and excessive scarring. There are many cystic pustular lesions about the size of an egg on the left side of his neck. He has been in the hands of surgeons who opened them but no treatment for acne has ever been given.

DR. HARRY ALDERSON: I had a similar case in which the pustular element cleared up entirely after three injections of a bacteriophage.

DR. H. J. TEMPLETON: We just finished work on a similar case in which treatment was given for a year. The patient had huge furuncles and burrowing sinuses over his whole body and neck. The usual treatment by means of diet,

roentgen rays, ultraviolet light and autogenous vaccines had failed to produce much improvement. A bacteriophage was made by Dr. Beckwith of the University of California. He believed that it should do good in this case as it destroyed the patient's organisms rapidly. A 10 cc. syringe was inserted into the opening of each lesion, and hours were spent washing these out with bacteriophage. The resulting recovery was spectacular. Considerable scarring and keloids remained and we planned to give gas and desiccate the larger ones and use roentgen rays subsequently if any new ones started.

ECZEMA SOLARE? XERODERMA PIGMENTOSUM? Presented by DR. H. J. TEMPLETON.

An infant, aged 2 years, had a perfectly normal skin up to the age of 10 months, at which time she was put into sunshine daily. After two or three days of long continued exposure her face became violently inflamed and sunburned. A permanent reticulation appeared on her face and neck following involution of the sunburn. Later, following exposure to sunshine again, the rash appeared on her arms and legs. Two possible diagnoses have to be considered: (1) possible prodromal warning of extreme sensitivity of the skin that might be an early stage of xeroderma pigmentosum; (2) eczema solare. The rash appeared only on parts exposed to the sun. No examination was made for hematoporphyrinuria.

DISCUSSION

DR. HARRY ALDERSON: Eczema solare is well worth considering. If there were any pigmentation it would be manifested at a very early stage. This child is almost an albino and naturally would be hypersensitive to sunlight.

DR. THOMAS CLARKE: Why could this not be telangiectasia following eczema solare? I think it is the end-result of inflammation.

DR. STUART WAY: I agree with Dr. Clarke that telangiectasia is the more probable diagnosis.

VITILIGO ASSOCIATED WITH ALOPECIA AREATA. Presented by DR. H. C. COE.

A girl, aged 16 years, had had vitiligo on her neck, arms and legs for about four years. She then had alopecia areata but considerable hair had regrown at the back of the neck. This new hair was white. I thought that this might be an endocrine disturbance so she was sent to the laboratory for a test of basal metabolism which was found to be —13. She was placed on thyroid, but no change in the vitiligo followed its use. She is presented because of the interesting combination. I would like suggestions as to therapy.

DISCUSSION

DR. HARRY ALDERSON: Has any one tried gold sodium thiosulphate in vitiligo as advocated by Lindsay? I am not recommending this procedure but I am curious to know of others' experiences with it.

DR. HIRAM MILLER: I think that it is just as well to stain the areas with a permanganate solution. This gives a good color and lasts for some time. Walnut juice may be tried but it is inferior to the permanganate.

DR. H. J. TEMPLETON: I treated four patients with vitiligo by from six to twelve intravenous injections of gold sodium thiosulphate. No improvement was noted.

COCCIDIOIDAL GRANULOMA. Presented by DR. H. J. TEMPLETON.

Mr. W. had been presented previously before the society but was presented again to show apparent recovery from the lesion following the use of colloidal copper and a vaccine prepared from *Coccidioides immitis*. He had received twelve

injections of colloidal copper intramuscularly and ten injections of *Coccidioides* vaccine intradermally. The only lesion that he had ever presented was a sharply marginated group of papulopustules, the size of a dollar, on the dorsum of the hand. He apparently recovered.

DISCUSSION

DR. JOHN GRAVES: The cure is more apparent than real. Two or three tiny places on the lesion look as if organisms might be found therein.

DR. L. R. TAUSSIG: Probably many mild cases are being missed all the time because of the fact that the lesions are small and apparently insignificant.

DR. STUART WAY: The cultures on different mediums vary considerably in appearance.

DR. E. K. STRATTON: Dr. Taussig's point is important. I think that this method of treating such cases is a good one.

DR. THOMAS CLARKE: Did the original appearance of the lesion suggest coccidioidal granuloma?

DR. H. J. TEMPLETON: The original picture closely resembled that of tinea profunda or kerion.

LUPUS VULGARIS. Presented by DR. H. J. TEMPLETON.

Miss D., aged 45, presented an extensive lupus vulgaris of the face which began at the age of 9 years. She had had many types of treatment including radium and roentgen therapy. In the last few years many epitheliomas had developed and had been destroyed with the actual cautery. She received gold sodium thiosulphate treatments without benefit. She was presented for purposes of discussion and to find out whether others had had any experience with the new Sauerbach salt-free diet. I have read many abstracts reporting good results from a diet with a high fat content with no salt and an abundance of vegetables. Some cases are reputed to have been cleared up. A mineral salt mixture is supposed to be given along with the diet.

NEUROFIBROMA. Presented by DR. S. C. WAY.

Tumors appeared on the right arm of a patient at the age of 21. At the time of examination, about twenty-six years later, they were thickly scattered over the entire body. They varied from 1 mm. to 2 cm. in size and were nonpigmented, more or less rounded in shape and easily compressible. Interspersed between these tumors were numerous, various sized areas of freckling or pigmentation. The patient's sister, father and paternal grandmother had the same disease. An operation for hemorrhoids was performed elsewhere. A microscopic examination of the material removed showed a close resemblance in structure to the external skin tumors.

DISCUSSION

DR. THOMAS CLARKE: I am interested in the regularity of the tumors. I have seen similar tumors, but they have been more irregular in size, some being large and some being small.

CONGENITAL ICHTHYOSIFORM ERYTHRODERMA. Presented by DR. H. J. TEMPLETON.

A young Korean, aged 20, came to the University of California Infirmary Clinic two years before presentation, complaining of a generalized dryness and redness of the skin which had existed as long as he could remember. His face was decidedly reddened, the skin being dry and drawn. Around the mouth were suggestions of rhagades, but the Wassermann reaction was negative and no other signs of syphilis existed. The skin of the whole body was dry. The flexures of the elbows and knees showed considerable reddening. Hot weather did not ameliorate his condition.

DISCUSSION

DR. HARRY ALDERSON: I would recommend that you try thyroid extract in this case.

DR. C. E. SCHOFF: I agree with the diagnosis and would suggest the use of whole suprarenal extract in conjunction with thyroid extract. I have had two patients recently that have shown remarkable improvement with such therapy.

DERMATOLOGICAL CONFERENCE OF THE MISSISSIPPI VALLEY

Annual Session—1929

Friday, Oct. 25, 1929, Minneapolis

SYPHILIS. Presented by DR. S. E. SWEITZER.

A man, aged 49, three years previous to presentation developed an erythematous patch below the right eye, which spread over the bridge of the nose on to the left cheek, with "butterfly" distribution.

He stated that he had a chancre in 1906, with no treatment. The Wassermann test of the blood and the Kahn reaction were 4 plus.

The lesion on the cheek resembled lupus erythematosus but showed considerable induration and some scarring with ectropion of the right eyelid.

SYPHILIS NODULAR (RESEMBLING SUBCUTANEOUS SARCOID). Presented by DR. H. E. MICHELSON.

A woman, aged 45, was presented because of numerous subcutaneous and cutaneous nodules in the skin of the face and chest. The nodules were hard and of a yellowish color. The Wassermann reaction was negative, and the biopsy showed closely packed perivascular infiltrate and some plasma cells. The husband had a positive history of syphilis, and with the patient under antisyphilitic therapy, the lesions rapidly receded.

DISCUSSION

DR. E. L. MCEWEN: I think that we should ask Dr. Michelson not to allow the term "syphilitic sarcoid" to get into the literature. Sarcoid is confused greatly as it is, and if we introduce the syphilitic element, it will lead to still greater confusion.

DR. C. W. FINNERUD: I thought that in Dr. Michelson's case the histologic picture was altogether that of syphilis, and not at all of sarcoid, and I believe the case should be classed as tertiary syphilis. In Dr. Sweitzer's case the color of the eruption would almost rule out lupus erythematosus. In spite of the interesting distribution of the lesions, I consider it also tertiary syphilis.

DR. H. R. FOERSTER: While I do not disagree with Dr. Sweitzer's diagnosis, I believe that the patient has also a seborrhea and a pustular folliculitis.

DR. H. E. MICHELSON: She has the most marked case of subcuticular nodular syphilis we have had the privilege of examining.

MULTIPLE EPITHELIOMATOSIS. Presented by DR. H. E. MICHELSON.

A woman, aged 52, stated that for the past eighteen years skin lesions had appeared on her body, which had been treated by various physicians, and that usually the diagnosis of tuberculosis had been made. Treatment in the past had been of a destructive type.

Examination showed some fifteen small areas situated over the body which were characterized by superficial crusts, which, when removed, revealed hard bordered infiltrate, which on microscopic section revealed squamous celled epithelioma. There was no glandular enlargement, and the patient's general condition was splendid.

A biopsy, done Sept. 10, 1929, from a lesion on the back was shown.

URTICARIA PIGMENTOSA. Presented by DR. H. D. DIESSNER.

A girl, aged 2½, had an eruption which had been present since the age of 3 months.

The eruption consisted of brown nodules, distributed over the trunk and arms.

URTICARIA PIGMENTOSA (ADULT). Presented by DR. S. E. SWEITZER.

A man, aged 33, presented numerous brown, slightly elevated papules over the body and extremities. The condition had been present since birth.

A biopsy was shown.

URTICARIA PIGMENTOSA (ADULT TYPE). Presented by DR. C. A. BOREEN.

A man, aged 30, had an eruption of twelve years' duration. General clinical examination gave negative results.

Inspection showed numerous reddish-brown, macular lesions which were more profuse over the chest, back and upper extremities. There was slight itching at times.

A biopsy specimen was shown which presented typical observations.

DISCUSSION

DR. S. E. SWEITZER: The patient whom I presented states that the condition has been present since childhood, and that it has remained stationary. He came for treatment because of ringworm of the feet, and I noticed the urticaria on his ankles. Further examination disclosed that it was widely distributed.

DR. C. W. FINNERUD: In most cases the eruption appears during the first six months, but there are cases on record in which the lesions were present at birth.

HYPERKERATOSIS PALMARIS ET PLANTARIS. Presented by DR. S. E. SWEITZER.

A child, aged 1½, presented a disorder, with the dystrophy confined to the palms and soles.

KERATOSIS FOLLICULARIS. Presented by DR. S. E. SWEITZER.

A woman, aged 39, had had the condition for thirteen years, with numerous acute exacerbations. She presented a follicular eruption of the forehead, sides of the neck and front and back of the chest.

She was first seen about nine years before presentation and returned a few weeks ago with an acute weeping eruption on the forehead. She was given a 5 per cent solution of the salicylic petrolatum and improved greatly.

A niece also had the disease, and it could be traced back for five generations.

A biopsy specimen was shown.

LINEAR NEVUS OF VERRUCOUS HEMANGIOMATOUS TYPE. Presented by DR. H. E. MICHELSON.

A woman, aged 34, stated that since birth she had had a series of lesions on her right leg, extending from the dorsum of the great toe to the knee. She also

stated that slight injury caused profuse hemorrhage which was controlled with difficulty.

The lesions were hemangiomas with a verrucous surface. No biopsy had been done.

KERATODERMA HEREDITARIUM PALMARE ET PLANTARE. Presented by DR. H. E. MICHELSON.

A boy, aged 8, showed a marked thickening of the palms and soles and areas of hyperkeratosis on the knees and elbows. The condition had been present since birth. There were no other members of the family, near or distant, who had a similar condition.

DISCUSSION

DR. E. P. ZEISLER: I wish to suggest the diagnosis of ichthyosis hystrix for the first case in this group. I agree with the diagnosis in the other cases.

DR. S. E. SWEITZER: I thought that this child possibly had keratosis palmaris et plantaris. I was struck by the intense black pigmentation on the feet. This is 50 per cent lighter than when the child was first seen, and the skin is not so thick. The diagnosis of ichthyosis hystrix may be correct as it belongs in this general group.

DR. H. E. MICHELSON: I should like to have some suggestions for therapy in this case of linear nevus. I believe that surgical treatment is indicated.

DR. E. A. OLIVER: I should suggest excision of the nevus.

DR. H. R. FOERSTER: I should suggest the use of carbon dioxide snow in the case of linear nevus.

DR. W. H. MOOK: I should suggest the use of radium on the lesion above the ankle with the keratosis.

DR. KARL ZWICK: It is my impression that in the last case of this group the localization of the hyperkeratoses is unusual. The flexor and extensor surfaces, the elbows and knees, besides the palms and soles, are generally the regions predominantly affected. This is not without significance, with reference to the diagnosis.

DERMATITIS FACTITIA. Presented by DR. H. E. MICHELSON.

A girl, aged 12, was presented because of a sharply circumscribed eruption situated on the cheeks and bridge of the nose. The areas were moist and in places covered with a bloody crust.

The history disclosed the fact that the eruption had been self-induced.

DISCUSSION

DR. E. C. GAGER: I saw this patient in the Ancker Hospital in St. Paul about five months ago. At that time she had a typical impetigo contagiosa. I lost track of her but understand she has not been free from lesions at any time. She was treated outside the hospital, and I do not know what was used.

DR. H. E. MICHELSON: This child developed an eruption just after the Easter holidays last year because she did not wish to go back to school. During the summer vacation she was free from trouble, but just before school began the eruption again appeared. This is a clear case of self-induced eruption.

DR. F. E. SENEAR: I think the interesting thing is that while the major portion of the eruption is horizontally arranged, on the knees the lesions are vertical.

DR. P. A. O'LEARY: This patient showed no pharyngeal anesthesia, a common observation in children with hysteria of this type.

DR. H. E. MICHELSON: This child is to be sent to the child guidance clinic for a careful environmental and psychic investigation.

LUPUS ERYTHEMATOSUS DISSEMINATUS. Presented by DR. H. E. MICHELSON.

A woman, aged 42, married, with two children, was presented because of several slightly elevated, scaling plaques situated on the cheeks and forehead. The lesions were dark bluish red. The past history was negative for tuberculosis, but the patient was anemic and complained of feeling poorly and of nervousness.

The plaques were sharply outlined and painful to touch.

The therapy had been gold sodium thiosulphate, with marked improvement.

LUPUS ERYTHEMATOSUS (PIGMENTED) WITH ATROPHIC SCARRING OF SCALP. Presented by DR. J. BUTLER.

A woman, aged 39, was first shown at the clinical meeting of the American Dermatological Association in 1923, when a diagnosis of "seborrhea nigricans" was made, for the skin then showed no changes other than pigmentation. At this presentation the lesions on the face appeared as a diffuse slaty pigmentation without apparent structural changes in the skin. The scalp showed the same pigmentation more pronounced on the vertex, with atrophic scarring typical of a discoid lupus erythematosus.

DISCUSSION

DR. H. E. MICHELSON: We feel that if fever is present in a case of disseminated lupus, it is not advisable to give a gold preparation. In fact if there are any constitutional symptoms, we would give a gold preparation with great caution.

DR. P. A. O'LEARY: Dr. Michelson's case impresses me as the type of lupus erythematosus due to focal infection. The removal of foci offers more satisfactory therapeutic effects than the administration of a gold compound.

DR. E. A. OLIVER: I have recently been seeing a good many cases of lupus erythematosus at the Veterans' Hospital in Chicago, and the patients have been treated in various parts of the country. I have been struck by the unusual number of failures with gold therapy. It seemed to show that the cases that are of tuberculous origin have responded readily, while the others in which no foci of tuberculosis have been found have not responded. I wonder if Dr. O'Leary and some of the others who have seen a number of cases have noticed this same thing.

DR. P. A. O'LEARY: I believe so, and I also believe that the results from the use of the various gold preparations are becoming more discouraging. We are constantly seeing more recurrences, and not infrequently the recurrence is more severe than the original attack.

DR. H. J. PARKHURST: What is the explanation of the pigmentation in the second case?

DR. A. W. STILLIANS: The patient said it was present before treatment was begun.

DR. H. E. MICHELSON: The second case was shown at the meeting of the American Dermatological Association in 1923, and at that time Dr. Pusey made a diagnosis of seborrhea nigricans. I do not know just where he classifies that condition.

DR. H. R. FOERSTER: I consider the apparent hyperpigmentation in this case to be a discoloration similar to that in Dr. Sweitzer's case of palmar and plantar ichthyosis and not a real pigmentation.

DR. C. C. TOMLINSON: I would like to ask what serious results are being seen from gold therapy. Apparently I have been using larger doses, and while I have seen some enlarged glands and elevation of temperature, I have seen nothing more serious and have thought that the therapeutic results were considerably better when there was some reaction.

DR. E. P. ZEISLER: I have recently had an experience that was almost disastrous. In a case of three years' duration, following two injections of gold

sodium thiosulphate, one of 50 mg. and the second of 100 mg., the patient developed a fulminating hemorrhagic type of lupus erythematosus with terrific stomatitis, purpura on the hands, feet, palms and soles, and purpura-like lesions on the chest and back. I was almost certain that the case was going to end fatally, but under treatment with sodium thiosulphate, the man recovered. I have given many injections of gold compounds twice a week in some instances, and have never before experienced a reaction of this type.

DR. R. S. WEISS: I had a somewhat similar experience in the case of a man with lupus erythematosus on the mucous membrane of the mouth. He developed a stomatitis and other symptoms, and I had to give sodium thiosulphate. He recovered and then disappeared from observation. I am now inclined to use a more conservative dosage of gold and sodium thiosulphate.

DR. H. M. HEDGE: In the case of a patient with several lesions, one on the nose, one on either cheek, and one behind the ear, I froze the lesions several times and was making fairly good progress, but smaller lesions appeared around the borders. I gave gold sodium thiosulphate, and hemorrhagic lesions and a high temperature developed, and the patient was confined at home. I did not give her any sodium thiosulphate, and while she was ill for five or six weeks, she finally recovered, but the lupus erythematosus was worse than before treatment.

THRUSH (MOUTH AND VAGINA). Presented by DR. H. E. MICHELSON.

A girl, aged 14, for the past six years had had lesions in her mouth and vagina. These lesions caused a white superficial deposit on the mucous membrane. Therapy had been of no avail.

The Wassermann reaction was negative. Cultures (exhibited) showed a luxuriant growth of yeast organisms.

DISCUSSION

DR. C. W. FINNERUD: This case was interesting to me in that with the mouth closed the child presented the classic picture of perlèche, and with the mouth open this was seen simply to be an extension of the yeast process to and slightly beyond the angles of the mouth. I think that speaks somewhat in favor of the etiology of the cases of true perlèche which I reported recently. I think it was extremely interesting that in this case there was an involvement of the nail of the right thumb, which I believe undoubtedly is a mycotic onychia and paronychia, although I do not know whether the organisms have been recovered from this area by Dr. Michelson.

DR. S. E. SWEITZER: Dr. Olson and I treated this child when she was a baby. She had thrush and then ecthyma gangrenosum developed, and she has had thrush ever since. We tried everything in the way of treatment, without success.

DR. I. ALLEN: The organism that was recovered looked like *Oidium albicans.*

DR. C. W. FINNERUD: In five of my cases of perlèche there were organisms resembling *Oidium albicans,* but according to Castellani's classification, they should be included with *Monilia.* Castellani has shown that organisms other than *Oidium albicans* can cause thrush.

DR. R. S. WEISS: My tentative diagnosis in this case is congenital syphilis. The child has a definite saddle nose, and there is a history of an "abscess" in the nose which was opened, drained and perhaps curetted. When an abscess occurs in this location of such severity as to destroy bony structures, one must carefully rule out syphilis, even though negative Wassermann and Kahn reactions have been obtained. It can do no harm to try antisyphilitic treatment, and it may help to clear up the diagnosis.

DR. C. W. FINNERUD: I think the history of vaginal involvement, as well as that of the nail, is important. I noticed that some of the white patches can be easily rubbed off and some cannot. This might well be a *Monilia* infection, somewhat similar to those described by Dr. Zeisler and Dr. Frost. The child may

have syphilis, but I think we should not attribute this combination of symptoms to that.

DR. H. E. MICHELSON: We have examined this child for syphilis time and again, and it has not been our experience that a congenital syphilitic subject has a negative Wassermann reaction. In fact, we have a hard time reversing the reaction to negative.

DR. C. C. TOMLINSON: I disagree with Dr. Michelson in regard to the Wassermann reaction in congenital syphilis. In my experience it is frequently negative in these cases.

DR. S. E. SWEITZER: When this child was an infant, she did not have the saddle nose. She had ecthyma gangrenosum, not erythema gangrenosum.

A CASE FOR DIAGNOSIS (LICHEN PLANUS ERYTHEMATOSUS) (ERYTHEMA INDURATUM? — LIVEDO RACEMOSA?). Presented by DR. H. E. MICHELSON.

A woman, aged 26, stated that a year previous to presentation a diffuse red eruption had developed on her legs, extending half way up the thigh and over the forearms. The eruption itched considerable and gradually faded, leaving a brown stain. At various times the process became acute and more red, only to calm down again.

On presentation there was a diffuse change in the skin from the toes almost to the hips. The surface of the skin was smooth, and here and there could be noted small red points which were apparently dilated blood vessels. The skin surrounding these points was brown, resembling melasmic staining. There was no atrophy of the skin, and although there was no particular configuration, the eruption as a whole presented a retiform appearance. The mucous membranes were free.

A biopsy done Oct. 24, 1929, from a lesion on the inner surface of the thigh, did not show lichen planus.

LICHEN PLANUS OF THE HORNY TYPE. Presented by DR. H. E. MICHELSON.

CASE 1.—A man, aged 70, stated that several weeks previously a more or less generalized eruption had developed on the arms, legs, trunk and palms, that the eruption consisted of small red to violet papules, and that there was considerable itching.

The lesions were typical for lichen planus. On the palms they were discrete, elevated and conical and contained a horny plug in their centers. Biopsy was not done.

CASE 2.—A man, aged 30, had a diffuse, generalized eruption of approximately two weeks' duration over the trunk and arms. The eruption consisted of small, flat-topped papules which scaled slightly. There was some itching. Mercuric salicylate had been used for treatment, and marked relief had been obtained.

DISCUSSION

DR. P. A. O'LEARY: The diagnosis of recurrent purpura seems justifiable to me. The history denotes recurrent attacks during the last few years, and the purpuric element is pronounced today.

DR. R. S. WEISS: The lesions in that case seemed to me to be pigmented scars, the result of embolic streptococcic processes in the skin. I think that this patient should be examined from the standpoint of internal medicine.

DR. J. GRINDON: This patient had several purpuric lesions, some on the inner fold of the thigh. The other lesions were scarlike, not only on the leg below the knee, but on the mammae and on the chest below were a number of much smaller ones. The lesions were of four types: the minute red purpuric points which did not fade on pressure; some telangiectases; a diffuse pigmentation, and the more distinctly papular lesions, some of which looked like lichen planus. I do not know what the condition is as a whole. The atrophic lesions were widely distributed.

DR. H. E. MICHELSON: This patient entered the hospital only last evening, and the condition suggested a lichen planus erythematosus to us, but a biopsy rules this out completely. It evidently is some form of vasomotor disturbance.

DR. W. H. MOOK: I thought there were two varieties of lesions: one, the pigmented scars which look like healed papulonecrotic lesions, and a network of pigmented areas that correspond to the distribution of capillaries, such as one sees in erythema ab igni. When I looked at the slide, I saw no changes except around the blood vessels. All the capillaries were distinctly infiltrated with small round cells. The lesion that was excised has nothing to do with the papulonecrotic-like lesions. I think that the woman is subject to a recurrence of this condition, and that the capillary blood vessels are congested, or at least dilated, with this infiltration. I believe that the involvement of the blood vessels is secondary to the infection.

DR. F. E. SENEAR: I thought this was perhaps the most interesting case shown. I do not see anything in the picture which is not in keeping with the idea that the eruption is due to endogenous intoxication, and I feel that the term tuberculids can be used as a diagnosis. We remember Guy's cases of tuberculids due to other types of organisms, and I think that this case can well fall into that group. Then it is necessary to search for the underlying infection in order to determine whether it is tuberculous or coccal.

DR. E. L. MCEWEN: I question seriously the wisdom of using the term "tubercular" to designate a skin lesion produced by the streptococcus or the staphylococcus. Technically, the word may be proper, because the lesion may be a tubercle, but the use of the term will add confusion to that which already exists in the nomenclature.

DR. P. A. O'LEARY: The presence of purpura is evidence of trauma to the superficial blood vessels. The traumatic factor may be either the tubercle bacilli or the cocci eliminated from some distant focus.

DR. H. E. MICHELSON: If we classify as tuberculous only those lesions in which we can demonstrate the tubercule bacillus with ease, we should have to change the entire dermatologic nomenclature in relation to tuberculosis. For example, lupus vulgaris is a classic form of cutaneous tuberculosis, and still the bacillus can be demonstrated with only the greatest difficulty. Clinically, we are able to diagnose erythema induratum and papulonecrotic tuberculid with comparative accuracy. We undoubtedly think of the condition as tuberculous when the diagnosis is made. I do not think that we should speak of nontuberculous tuberculids. We may think of papulonecrotic lesions of nontuberculous etiology if we wish, but when we speak of a papulonecrotic tuberculid, we mean a definite clinical entity.

DR. J. GRINDON: We call these things tuberculids because it was first thought that the tubercle bacillus was the only thing that could produce them. I think what Dr. Michelson said is not to the point, for when we call these cases erythema induratum, we do not commit ourselves. When we call them tuberculids, we do. Why not call them "bacterides"? I propose that name.

TUBERCULID EN PLAQUE. Presented by DR. E. E. SWEITZER.

A girl, aged 15, was first seen in September, 1927. At that time she presented numerous elevated, flat lesions on both legs and the body, with a few on the arms. The lesions looked very much like a phenolphthalein eruption, there being large, flat, elevated plaques, some of which were bluish while some were slightly yellow. The condition had been present about a year and a half and had started on the right ankle.

The personal and family histories were essentially negative.

The results of the physical examination were negative, except for the presence of the skin eruption.

A Pirquet test was negative, as was guinea-pig inoculation of biopsy material, and a postmortem examination on the guinea-pig did not reveal any pathologic

process. A roentgenogram of the chest did not show any conclusive evidence of tuberculosis, although there was some thickening at the apex on both sides and at the hilus.

The biopsy report was tuberculosis, and the diagnosis was made of tuberculid en plaque. The patient was treated with arsenic in the form of neoarsphenamine, and most of the lesions disappeared. A few new lesions had appeared from time to time and had responded to treatment.

A photograph showed the appearance when the patient was first seen, in 1926. She was shown at a meeting of the Minnesota Dermatological Society in 1926, when the diagnosis of tuberculid en plaque was suggested by Professor Gans of Heidelberg.

The patient at present showed a few active lesions and some depressed scars of former ones.

TUBERCULID: GENERALIZED, PAPULONECROTIC WITH TUBERCULOSIS COLLIQUATIVA. Presented by DR. H. E. MICHELSON.

A man, aged 40, gave a history of having an eruption on the trunk for the past ten or twelve years. The eruption consisted of various sized nodular, necrotic and crusting papules and circumscribed white scars situated over the entire trunk and arms. On the right cervical region were noted several soft, fluctuating masses from which exuded a serous pus. The Pirquet reaction was strongly positive. There had been marked improvement with rest and Gerson diet.

The histology showed a tuberculoid reaction.

TUBERCULOSIS COLLIQUATIVA. Presented by DR. H. E. MICHELSON.

A man, aged 67, had never had a similar condition. The onset was one year previous to presentation with cervical adenitis followed by ulceration. There was no evidence of active tuberculosis elsewhere.

The diagnosis was confirmed by microscopic section and guinea-pig inoculation.

DISCUSSION

DR. J. GRINDON: The last case in this group was interesting to me, because I have not seen this type of tuberculosis in a patient of that age. This form is commonly seen much earlier in life.

DR. F. E. SENEAR: I was interested particularly in the first case in the group, because during the past few weeks I have happened to see two cases of a type that brought up the possible relation between erythema nodosum and tuberculosis; that is, the classification of some cases of erythema nodosum with the tuberculids. In each of these patients the condition has been present on the anterior rather than on the posterior surface of the leg, where one would expect the Bazin type. The condition has been nonulcerative in one case and ulcerative in the other. In one case the lesions were tender, and in the other they were mildly tender. The disorder has persisted long beyond the time period we would expect in ordinary acute erythema nodosum, which we commonly associated with arthritis. In the cases with the localization on the anterior aspect I think it is worth while to keep in mind that the clinical picture presents some of the features of erythema nodosum, particularly the anterior localization and tenderness, and some of the features of erythema induratum in the chronicity and the ulceration. It is hard to fit this case in that group, because the lesion on the anterior surface of the thigh is apparently not typical today, and the condition has subsided to such an extent that much is not apparent now.

DR. C. W. FINNERUD: In the first case I should suggest gold therapy. I have seen good results recently in several cases of erythema induratum and papulonecrotic tuberculid in which a gold compound has been administered, and I think it would end this patient's trouble.

DR. F. E. SENEAR: Dr. Finnerud has brought up the question of gold therapy, and while I listened to the reports on the serious results following the use of a

gold preparation, I could not help thinking of Professor Bloch's amazement at the size of doses we use here. He brought out that in Europe the use of gold is frequently alternated with that of silver arsphenamine, thus keeping in the heavy metal group but getting away from the single toxic agent.

DR. H. E. MICHELSON: Dr. Sweitzer's case should be discussed because it is an unusual form of cutaneous tuberculosis. This child was shown to Professor Gans, and he called our attention to some of the literature on the subject which I investigated. The clinical lesion was a sharply circumscribed bluish plaque with no surface change and a typical tuberculoid pathologic process in the corium. Recently in the British literature a morphea-like type of lupus has been discussed, which I judge is similar in appearance to Dr. Sweitzer's case.

DERMATITIS HERPETIFORMIS. Presented by DR. H. E. MICHELSON.

A man, aged 42, stated that up to a year before presentation he had no skin disease. His past history was negative in every respect. The present eruption consisted of large groups of wheals, papules and vesicles situated over the shoulders, back, arms and face. The patient complained of intense pain and itching and stated that may times he was unable to drive his automobile because of the annoyance. The therapy consisted of arsenic and local applications.

DISCUSSION

DR. H. E. MICHELSON: This patient is intelligent, and his description of the subjective symptoms of the condition is accurate. He states that when the paroxysm of itching comes on, he must stop and scratch the lesions even if he is driving his car. Arsenic has had no effect on the disorder, but roentgen treatment over the spine has given him much relief.

DR. R. S. WEISS: It may be worth while to bring up the fact that Dr. Jerome Cook and I have been studying a number of these cases, and in several instances we have found enlargement of the liver associated with dermatitis herpetiformis. In two cases the gallbladder was drained and the skin disease cleared up, but when the sinus healed, the dermatosis recurred. One case came to necropsy, and definite biliary cirrhosis was found. I think it would be worth while to check up all cases of dermatitis herpetiformis with the idea of finding definite liver damage.

SARCOMA, IDIOPATHIC MULTIPLE HEMORRHAGIC (KAPOSI). Presented by DR. H. E. MICHELSON.

A Jew, aged 55, stated that two years before presentation he noticed thickenings on the dorsa of several toes.

On presentation there was noted numerous slightly elevated sessile tumors situated on the toes, dorsa of the hands, over the bridge of the nose and on the forehead. The lesions were dark blue and hard, and had gradually progressed in size. The patient also stated that he had lost about 15 pounds (6.8 Kg.) in weight but had no apparent symptoms of internal involvement.

Biopsy done Jan. 12, 1929, from a lesion on the nose showed atrophy of the epidermis, marked increase of pigment and a closely packed circumscribed fibrocellular infiltrate directly beneath the epidermis.

DISCUSSION

DR. C. W. FINNERUD: I think there is no question about the diagnosis. It is one of the few cases of Kaposi's type of sarcoma that I have seen without verrucous thickening of the margins of the dorsum of the toes.

DR. H. E. MICHELSON: This patient has been much improved by roentgenotherapy and heavy doses of arsenic. The first lesions appeared on the nose and the toes. Microscopic section verified the clinical diagnosis.

CIRCUMSCRIBED SCLERODERMA. Presented by DR. B. A. GINGOLD.

A white girl, aged 17, stated that at the age of 14 a linear scar appeared at the middle of the forehead, extending from the margin of the hair line across the

forehead to about half the distance of the nose. This area had widened to about three fourths of an inch at its widest area. The skin had become markedly atrophic, forming a depression. The bone showed no involvement. There was nothing of interest in the past history, and no record of any injury sustained in this area.

The patient was presented for consideration as to the feasibility of cosmetic surgery.

SCLERODERMA. Presented by DR. S. E. SWEITZER.

A woman aged 65, noticed first an itching and later an eruption on the shoulders and arms. The lesions were hard, firm and whitish. Inspection showed a profuse eruption over the entire trunk, both front and back, and the arms were also involved. The lesions had been present for about two years. Biopsy showed scleroderma.

DISCUSSION

DR. A. W. STILLIANS: I was much impressed by the linear atrophy in the case of the little girl. She said it had never felt anything but soft, as it does at present. Although it seems to be generally agreed that the case is one of scleroderma, I wonder how we can call it that if we cannot demonstrate that it has ever been infiltrated.

DR. S. E. SWEITZER: The reason this patient came here was to find out any possible suggestions for treatment. My idea was to have the lesions excised. She is a young girl, and the condition is humiliating. I think we could get a better scar than the present one.

DR. P. A. O'LEARY: The term morphea seems preferable in this case rather than scleroderma. Removal by excision would possibly be followed by extension of the atrophy which no doubt she would attribute to the surgical intervention.

LYMPHOBLASTOMA, MYCOSIS FUNGOIDES TYPE. Presented by DR. H. E. MICHELSON.

A man, aged 44, was first seen in May, 1929, with a weeping dermatitis of the face and legs. The hands and arms showed some hyperkeratosis. The skin of the body was dry and thickened with almost circular patches of dermatitis from which exuded serous pus. There was also some hyperpigmentation over the back. Generalized adenopathy was marked.

Laboratory observations were as follows: Wassermann test of the blood, negative; blood uric acid, 4.2; creatinine, 1.61; basal metabolic rate, plus 9 per cent; hemoglobin, 86 per cent; red blood cells, 5,200,000 and white blood cells, 8,000. The histology suggested Hodgkin's disease and tuberculosis of the lymph nodes.

The lesions had receded under roentgenotherapy.

LEUKEMIA CUTIS. Presented by DR. H. E. MICHELSON.

A farmer, aged 58, stated that the onset of his present condition occurred two years before presentation with a diffuse, discolored swelling of the toes of both feet which was followed by lesions on the other involved areas. The infiltration of the face, which was the most recent part involved, had been present for more than a year.

He had felt well throughout, although recently he had noticed a loss of strength. The liver was not enlarged; the spleen was not palpable.

The Wassermann reaction of the blood was negative. Examination of the blood showed hemoglobin, 71 per cent; red blood cells, 3,600,000; white blood cells, 105,000; polymorphonuclear leukocytes, 5 per cent, and lymphocytes, 95 per cent.

The eruption consisted of diffuse scaling located on the face and the arms. The areas were firm and livid and were not sensitive to touch. Biopsy done on

Sept. 15, 1929, showed slight atrophy of the epidermis and marked infiltrate of lymphocytic cells.

DISCUSSION

DR. W. H. MOOK: I think that this first case had more of the clinical features of mycosis fungoides than of lymphoblastoma.

DR. E. A. OLIVER: I agree with Dr. Mook. I have about three of these cases under observation now, and the condition in this case does not seem to simulate lymphoblastoma appreciably. I thought it was mycosis fungoides. The last case I thought was a good example of leukemia of the skin, and Dr. Michelson should be congratulated on working it up so well.

DR. C. W. FINNERUD: I agree with the diagnosis of mycosis fungoides in the first case under discussion. I have studied the histology in a number of these early cases which turned out definitely to be mycosis fungoides. The histologic picture conforms with that shown here, and is different from the changes seen in exfoliative dermatitis and disorders other than early mycosis fungoides, I believe. I think that the infiltrate is not specific. In all the cases I have examined, there is the psoriasiform type of proliferation of the epidermis, the papillae extending almost to the stratum corneum, as in this section, and superficially there are miliary abscesses. I feel that this case will turn out to be mycosis fungoides. I had this impression when looking at the slide before seeing the patient.

DR. H. E. MICHELSON: The patient was presented with a diagnosis of lymphoblastoma. One of the most striking features was the rapid response to roentgenotherapy. This made us lean toward a diagnosis of mycosis fungoides.

DR. J. GRINDON: The best marked case of leukemia cutis I ever saw cleared up in two or three days when the patient was put to bed. The stony hardness of all palpable lymphatic nodes in this case was characteristic.

CHRONIC VEGETATING PYODERMA. Presented by DR. H. E. MICHELSON.

A girl, aged 14, was presented because of a generalized skin condition which had been present for six years. She stated that it began with an abscess forming in the bone of the heel. Surrounding this area a fungating lesion developed, and gradually lesions of a similar type appeared on other parts of the body.

On presentation numerous soft tumors were noted over the feet, legs, hands, arms and back. The individual lesions were discrete, and the size of a quarter. They were elevated in some places half an inch and were fairly hard in consistency; pus could be expressed from them. In addition to these tumors were plaques consisting of small elevated papules which itched a great deal and caused the patient to make excoriations.

A biopsy done on Oct. 11, 1929, from a lesion on the thumb, showed a dense nonspecific infiltrate of the entire corium. The patient had been seen by various physicians, including the Mayo Clinic staff, where a diagnosis of xanthoma tuberosum multiplex had been made. Biopsy done here did not substantiate that diagnosis. Sections taken at Rochester and those done here were exhibited.

DISCUSSION

DR. J. GRINDON: In places I could find hard papules, the tops of which had been torn off by scratching. In other places there were pustules and secondary infection. The keloidal lesions on the fingers were definite. I look on the case as probably one of prurigo with a secondary development of keloid on the fingers and hands.

DR. E. P. ZEISLER: It seemed to me that the girl has a neoplasm that belongs in the xantho-endothelioma group complicated with a pyoderma. The yellow xanthoma color is lacking, but the lesion has the configuration seen in the plaque-like form of xanthoma tuberosum, and I think that it is a xantho-endothelioma of the skin. I saw no suggestion of keloid.

Dr. P. A. O'Leary: This child was under our care for weeks about a year before presentation. At that time she did not have as many lesions on the lower extremities as are present today, and neither were the pustules present at that time. From the histopathologic study a diagnosis of xanthoma multiplex tuberosum was made. Trauma over the forearm and hand produced lesions which histopathologically were those of xanthoma. Studies of the blood chemistry were of no significance. I believe that the diagnosis of xanthoma multiplex tuberosum is still justified, and that the pyoderma is the result of a superimposed infection.

Dr. H. E. Michelson: We have not been able to confirm the diagnosis of xanthoma tuberosum multiplex that Dr. Montgomery made at Rochester. We feel that we are dealing with a chronic vegetating pyoderma, but we respect the previous diagnosis and are going to continue our investigations.

Dr. C. W. Finnerud: In the two sections I examined I saw no evidence of keloid formation nor of xanthoma. There were many cells in the infiltrate which resembled degenerated polymorphonuclears, but I have no diagnosis to offer.

Dr. Karl Zwick: Unless one is willing to establish a category of xanthomatous lesions without pigment (xanthoma sine xanthosi), one would have difficulty in maintaining the diagnosis of xanthoma for the tumor-like lesions in this unusual case. At least I observed no distinctly yellow pigmentation which is considered characteristic of xanthomas. The yellow tint in xanthomatous tumors is due to the presence of carotin or carotinoids (lipochromes). Their presence may be determined by means of color reactions. Cholesterol is white. Its presence may conveniently be determined with a polariscope (polarimeter), which reveals the doubly refracting crystals.

A Case for Diagnosis (Exfoliative Dermatitis). Presented by Dr. S. E. Sweitzer.

A woman, aged 28, gave a history of erythema induratum seven years previous to presentation which was treated with a series of intravenous injections of neoarsphenamine. Four years later she had a recurrence and again received neoarsphenamine, with little or no therapeutic result. In June, 1928, she was placed on intravenous injections of gold and sodium thiosulphate, ten injections being given at weekly intervals. The last treatment was given Sept. 21, 1928. On Nov. 13, 1928, she developed a generalized exfoliative dermatitis which pursued a chronic course. In August, 1929, she returned with the present condition. The skin showed a patchy appearance with numerous light atrophic and red areas. The condition had improved slowly, and the areas of redness were getting lighter than when first seen.

Biopsy showed considerable infiltration of the papillary layer, with areas of atrophy of the epidermis.

DISCUSSION

Dr. W. H. Mook: This girl had pigmented remnants of a former eruption, which she said she had some time previously. This impressed me as an eruption caused by a drug, and it may be an eruption from gold therapy. She had received injections of a gold compound, and later had exfoliative erythema pigmentosa; she still has an eruption on her back.

Dr. P. A. O'Leary: The patient apparently has had an exfoliative dermatitis with a residual lichen planus-like eruption, similar to that seen following the injection of arsphenamine.

Dr. C. W. Finnerud: Several cases have been shown recently in Chicago in which there was considerable question between lupus erythematosus and lichen planus, not only from the clinical but also from the histologic point of view, most if not all of which I have thought to be lupus erythematosus. I thought of this also as being an unusual case of lupus erythematosus. Two of the lesions, one in particular, that on the lower lip, would fit in well with that diagnosis.

DR. F. E. SENEAR: There was one point in line with Dr. Finnerud's remarks which has not been mentioned that interested me. Over each breast, more particularly on the right, the patient has a linear type of atrophy criss-crossing and forming a network and a great deal of telangiectasis in the form of patches. The picture is not unlike that in cases we have seen in Chicago in which poikiloderma atrophicans vasculare has been considered and not unlike a radiodermatitis. I think the picture is more like that of lupus erythematosus than of a toxic eruption, although she may have had a gold dermatitis as well.

DR. H. R. FOERSTER: I am of the same opinion as Dr. Senear. Some of the lesions, particularly those on the breasts, have poikiloderma-like characteristics that have been recognized as features of disseminative lupus erythematosus in similar cases shown at previous meetings.

DR. S. E. SWEITZER: The patient was treated for erythema induratum, and was given large amounts of arsenic. The lesions always improved but did not heal. She was put on rest and given a considerable amount of a gold compound, with apparently no bad results at the time. She disappeared for a time and returned with a generalized eruption which looked like pityriasis rosea, aggravated by bathing, She had patches of a severe exudative type over most of her body. Within a few days an exfoliative dermatitis developed, which involved the entire body, scalp and feet. She was placed in the hospital and gradually improved, went home and returned a few weeks ago with this patchy, atrophic-like condition over the areas where she previously had the exfoliating lesions. My impression was that she had an exfoliating dermatitis, and that this condition resulted from the gold therapy.

RAYNAUD'S DISEASE (?). Presented by DR. H. G. IRVINE.

A man, aged 30, whose occupation was dumping bags of flour, on Sept. 14, 1928, developed soreness at the finger-tips where he grasped the bags, and in April, 1929, he was forced to stop work. He complained of pain in these fingers and stated that crusts formed on the ends and peeled off. The flesh was gradually drawing away from the ends of the nails.

The results of a general examination, including the Wassermann test, examination of the blood and blood chemistry, were negative. Roentgen examination showed normal bones. His basal metabolic rate was —7. He had received no treatment.

DISCUSSION

DR. E. L. MCEWEN: I think it rather interesting that the symptoms should be confined to one hand in this case.

DR. J. GRINDON: Raynaud, in his original report, recognized nonsymmetrical cases.

PITYRIASIS LICHENOIDES CHRONICUS (JULIUSBERG). Presented by DR. H. E. MICHELSON.

A man, aged 22, stated that for some time past his trunk had been covered with numerous discrete spots which caused him no inconvenience. The lesions consisted of macules and papules varying in color from a salmon red to a sepia. Some of them showed an adherent scale which on removal revealed no pin-point bleeding. The lesions were strictly confined to the trunk.

Biopsy done March 1, 1929, from a lesion on the upper part of the chest showed a slight hyperkeratosis and a marked parakeratosis of the epidermis, some acanthosis and a slight infiltrate of the corium. The microscopic observations were consistent with the clinical diagnosis.

DISCUSSION

DR. J. GRINDON: To my mind this case does not conform to the Juliusberg type, although it is parapsoriasis. I did not see any lesions resembling lichen planus.

PRURIGO IN HODGKIN'S DISEASE. Presented by DR. H. E. MICHELSON.

A man, aged 56, two years previously developed enlarged glands in the neck and numerous hard scattered papules over the arms and legs which itched intensely. He had received roentgenotherapy over the gland areas, and his general condition had improved, but the itching dermatoses persisted.

Biopsy of a gland showed Hodgkin's disease. Biopsy of the skin showed a nonspecific inflammation.

DISCUSSION

DR. H. E. MICHELSON: This is the usual type of prurigo in Hodgkin's disease. After roentgen treatment over the glands, the itching has usually subsided for a time.

DR. R. S. WEISS: It is interesting to consider the different types of skin lesions one finds in cases of Hodgkin's disease. Here we have a definite disease producing prurigo-like lesions in one case, urticaria in another; lesions simulating toxic erythema and erythema nodosum; lesions of the purpura group and lesions like erythema multiforme. That the same etiologic agent can produce different types of skin lesions was pointed out by Dr. Engman and myself in our paper on the "Erythema Group," and Hodgkin's disease is one condition that points this out clearly.

EPIDERMOLYSIS BULLOSA OF THE DYSTROPHIC TYPE. Presented by DR. H. E. MICHELSON.

A woman, aged 25, stated that since birth she had had various bullous lesions on points of trauma and that when these blisters healed, the skin would be left thin and glossy. She had three children and said that at the time of childbirth the birth canal was severely traumatized, and many blisters formed which were slow to heal. She also frequently had lesions in the month, and the scarring that resulted had caused a marked change in the tongue and gums.

On examination it was found that she had many flaccid bullae over the arms, legs and body, and there were numerous scars of previous lesions. The nails had been lost on the hands and feet, and the fingers were tapered and atrophic in appearance. The family history was completely negative.

A biopsy was done June 25, 1929, from a healed area on the arm which showed many epidermic cysts in the scar, and a biopsy from a blistered area on the leg showed a thin-walled bulla, the blister being between the epidermis and the corium.

Saturday, Oct. 26, 1929, Rochester, Minn.

SARCOID (BOECK). Presented by the MAYO CLINIC.

Mr. J. N. L., aged 43, came to the Mayo Clinic in 1927, complaining of bilateral swelling of the parotid region which had been present for ten or fifteen years, although he was not sure of the exact length of time. A diagnosis was made of sarcoid. Biopsies done from two different places showed a picture in one area of sarcoid of Boeck, and in another area that of sarcoid of Darier-Roussy. The patient also presented multiple lipomas. The microscopic study showed no tuberculoid structures in the lipomas.

A roentgenogram of the chest done in November was negative (?). A roentgenogram of the bones of the fingers of both hands was negative (?). The Mantoux test was negative. The patient also had atrophic rhinitis.

He had received various forms of treatment, including three courses of neoarsphenamine given in 1927. He was also given Kromayer light with pressure, following which there was about a 50 per cent improvement. In August, 1928, he was put on a course of treatment with 4 amino—2 auro—and received twenty-five injections, from 250 to 375 mg. each, without any material improvement.

DISCUSSION

DR. J. GRINDON: There was no doubt about the lipomas, which had nothing to do with the rest of the condition. I was not satisfied with the diagnosis of Boeck's sarcoid, for the lesions seemed to me to be the color of lupus pernio. I think the condition is not so sharply outlined as I expect Boeck's sarcoid to be.

DR. W. H. D. GOECKERMAN: This is one of the cases that I reported about a year ago. It was the case that first called my attention to the connection between these various tuberculous diseases, both clinically and morphologically. The case has many features of lupus pernio and of Boeck's sarcoid, and the other lesions on the body suggested the Darier-Roussy type of sarcoid. In studying the case I have come to the conclusion that these are simply some differences in the manifestations in the skin rather than any differences in the particular mechanism by which they are produced. When first seen, the man had some nodules on the legs, which have disappeared, I do not know whether as the result of treatment or in spite of it. This showed that he had that particular associated feature so often described in the literature. He also had some of the many systemic manifestations so often referred to in the literature. I was pleased to find on my recent visit to Jadassohn's Clinic that they are in accord with us on these cases. They will not refer definitely to any particular type of sarcoid, but will refer to them as indurative tuberculosis of the skin. The histologic picture of lupus pernio is about the same as of Boeck's sarcoid. We did not find the tubercle bacillus in this case nor in any other of our cases.

DR. KARL ZWICK: Do you consider these lesions due to the direct action of the bacillus?

DR. M. H. EBERT: Was the tuberculin test negative?

DR. W. H. D. GOECKERMAN: Yes, the tuberculin test was negative. I discussed this with Jadassohn recently, and he stated that these patients are often so anergic that the tuberculin reaction is no longer present.

DR. M. H. EBERT: In this connection I would like to mention the fact that Professor Jadassohn speaks of positive and negative anergy. Anergy as contrasted with allergy is a condition in which the skin does not react to an injection of tuberculin. The patient is said to be in a state of negative anergy when he has no resistance to the bacillus and when the tuberculin reaction is negative. He is in a state of positive anergy when the tuberculin reaction is negative, but the patient's resistance to the tuberculous infection is high. Such a state of positive anergy is often present in sarcoid, lupus pernio and lupus miliaris disseminatus.

DR. H. E. MICHELSON: It has been noted that in tuberculids the Pirquet reaction simulates the clinical lesion present.

PSORIASIS: ARTHROPATHY PSORIATICA. Presented by the MAYO CLINIC.

Mr. C. B., aged 24, a farmer, since the age of 10 had had recurring attacks of psoriasis associated with "acute inflammatory rheumatism." The first attack had occurred fourteen years before presentation, another two years ago, and the present attack in January, 1929. The psoriasis began as a localized patch over the knee and became universal. As it extended it was accompanied by swelling of the joints, at first of the phalanges and later of the large joints of the extremities and of the spine. The condition had become progressively worse during the past two months. In the past, when the psoriasis cleared up the arthritis became much improved.

PSORIASIS: ARTHROPATHY PSORIATICA. Presented by the MAYO CLINIC.

Miss B. D., aged 46, an editor, had had recurrent attacks of psoriasis of nummular type for twelve years, the condition responding fairly well to treatment until five years previous to presentation, when it became universally dis-

tributed. One year later she had a severe attack of polyarthritis, although the fingers and toes had been tender and swollen for several months.

In 1926, she remained at the clinic for six weeks and showed marked improvement in the arthritis following the treatment of the psoriasis. At the time of dismissal she was able to walk unaided and to help herself in dressing. Local treatments to the skin were continued at home, together with exercises of the affected joints. Skin lesions reappeared within six months, but responded fairly well to local treatment.

During the past summer the psoriasis had spread and become generalized. Two weeks before presentation the arthritis recurred, involving the large joints of the extremities, so that the patient could not walk or feed herself. The fingers and toes were particularly involved, presenting a fusiform swelling of the smaller joints; on the right, the thumb, and on the left, the third finger, were affected.

Treatment for the psoriasis had been resumed on Oct. 21, 1929, and consisted of the use of crude coal tar applied locally, with ultraviolet light in systemic exposure to the skin. For the arthritis application of heat to the joints and hot baths were used.

DISCUSSION

DR. J. GRINDON: It seems that this is a case of combined arthritis and psoriasis of a somewhat different type from those I am accustomed to see. Arthritis of one grade or another is not rare in psoriasis. There are cases of the rupoid type, which are perhaps not really psoriasis. They are often associated with high grade arthritis. These are often moist, with a moist base instead of the dry base one finds after removing the scale in psoriasis. From what I could learn, the cases shown today were not of that type.

DR. H. E. MITCHELL: I talked with the first of these patients, and he told me that he had had two attacks of gonorrhea. I wish to ask whether it is possible that the arthritis may be coincidental with the psoriasis but due to the gonorrheal attack.

DR. KARL ZWICK: It is reported in the literature that cases belonging to the arthropathic type of psoriasis respond to massive doses of potassium iodide, in regard to both skin and joint symptoms, provided the treatment is started early in the course of the disease.

DR. L. A. BRUNSTING: We presented these patients because of the apparent difference in opinion as to whether the arthritis was entirely unassociated or whether it was associated with the syndrome of psoriasis. The one patient has been here just three days. The woman was here three years ago, and without any particular treatment except to the psoriasis the condition cleared up largely so far as the arthritis was concerned. Neither patient has had any iodide. It is interesting that the joints first involved are those of the distal phalanges.

DR. E. L. MCEWEN: In reference to the first of these cases, I asked the patient about the time the rheumatism and the psoriasis appeared. He said the rheumatism began at the age of 4 and the psoriasis at the age of 10. He also reported that there was a relationship between the improvement and exacerbation.

DR. W. H. D. GOECKERMAN: These patients, a considerable number of them, improve when the psoriasis is treated externally. That at once raises the question as to the relationship.

DR. P. A. O'LEARY: We have had approximately sixty cases of psoriasis and arthritis. In the majority of them there is a definite relationship, and in this group I believe the psoriasis is the source of the foci leading to the production of the arthritis. The psoriasis is usually mild in this type, however. There have been some cases in which the presence of the two diseases in the same patient was merely coincidental. A few cases comprised a third group in which both diseases were present, the arthritis the prominent one and of the type resistant to the usual therapeutic measures.

RAYNAUD'S DISEASE, SCLERODERMA, SCLERODACTYLIA. Presented by the MAYO CLINIC.

Miss G. N., aged 32, came to the Mayo Clinic in May, 1927, complaining of trouble in the hands and feet, and occasional gastric difficulty. Since early girlhood she has had frequent attacks of tonsillitis and quinsy. In the fall of 1922 she had a tonsillectomy, and one month following this she noticed the onset of numbness in the hands. At intervals from that time on the hands would become "dead white," particularly if they were exposed to cold. Each year thereafter the difficulty became worse, especially during the winter, and the hands gradually became more purple with fewer attacks of ischemia. In addition to the changes in color the fingers became stiff, and small ulcers developed on the finger-tips. In 1926, about three years after the onset of the difficulty in the hands, a similar trouble started in the feet.

A diagnosis was made of Raynaud's disease with secondary sclerodermal changes in the hands and trophic changes in the feet. The blood vessels were thought to be open but diminished in caliber. The retinal arteries, as shown by examination of the fundus, were rather tortuous. Roentgenograms of the extremities were negative.

She returned in October, 1927, at which time Dr. Adson did a bilateral lumbar sympathectomy, ganglionectomy and ramisectomy, with the result that the feet became much warmer, the cyanosis in them entirely disappeared, and the skin was softer. The persistent aching in the calves had disappeared, as had also the soreness and tenderness. On the other hand, she complained that the feet became flushed, with alternate periods of heat and burning, and that the skin was dry. There was a tendency toward swelling of the ankles, particularly in warm weather. At this time pulsations in the vessels of the feet were normal, though it was thought that the sclerodactylia was more pronounced. The patient returned at this time for a thoracic sympathectomy for relief of the upper extremities. More recently she had complained of superficial ulcerations of the feet at points of trauma such as the malleoli. During the past year she had also lost considerable weight which she had gained previously.

SCLERODERMA WITH SCLERODACTYLIA. Presented by the MAYO CLINIC.

Mrs. E. B., aged 50, was normal until eight months before presentation, when without any immediately associated cause there appeared symmetrically a stiffness of the fingers. Within a month the face began to stiffen, and there was difficulty in opening the mouth. The condition of the hands and face progressed, and the skin of the ankles became involved. The condition had gradually been getting more extensive. The face had a masked, iron expression, the skin being hidebound. About the neck were numerous depigmented striations extending down over the sternum. The hands were held in semiflexed formation. They were cold and of purplish appearance. The patient had all her teeth extracted during the latter part of July, without any appreciable effect on the condition of the skin.

On Oct. 15, 1929, bilateral sympathetic ganglionectomy and ramisectomy were done, resection being carried from below the second thoracic to above the cervical thoracic ganglions. Since the operation there had been a decided increase in temperature of both upper extremities. The hands had an appreciable reddish tinge, and there was a total lack of sweating.

DISCUSSION ON CASES OF SCLERODERMA

DR. P. A. O'LEARY: I should like to emphasize the point that sympathetic ganglionectomy is suitable only in those cases presenting the Raynaud phenomena in addition to the scleroderma. We have heard that patients with generalized scleroderma without vasomotor disease have had ganglionectomy performed without improvement. The vasomotor type of scleroderma with sclerodactylia and sclerodermatous involvement of the face and upper part of the chest is well known to dermatologists. The second case in this group demonstrates the type of

case best suited for the operation. The results of sympathectomy appear shortly after operation and are manifested by increased blood supply, warmth, loss of pain, and later on softening of the sclerodermatous infiltrate. The greater the degree of the vasomotor spasm present, the more pronounced the therapeutic effects have been.

DR. H. E. MICHELSON: The older literature clearly brought out the fact that early scleroderma which responded to treatment with thyroid often receded without leaving atrophic scarring.

DR. H. R. FOERSTER: The French medical literature contains references to successful radicular roentgenotherapy in cases of scleroderma. I have tried this method, which consists in applying filtered x-rays, in approximately five-eights skin units, to the cervicothoracic and lumbosacral areas of the skin at sites of the sympathetic nerve plexuses. While the patients have been under observation only a short time, the scleroderma lesions have undergone definite regression. I consider the method worthy of investigation and trial in view of its simplicity and safety as contrasted to a difficult surgical procedure.

DR. KARL ZWICK: It would be interesting to do a biopsy after the patients have improved under treatment, as one might hope to learn something about the pathogenic mechanism of the disease.

DR. H. MONTGOMERY: In order to demonstrate the edema and early transitory changes in the smaller blood vessels in the early stages of scleroderma, it would probably be necessary to put the biopsy tissue immediately into a boiling solution of formaldehyde. The usual methods of fixation cause too much shrinkage of the tissue. Thus a biopsy of an urticarial wheal put in the ordinary fixatives often fails to show microscopically the edema that is present clinically.

TRICHOPHYTOSIS OF THE HANDS—TRICHOPHYTID. Presented by the MAYO CLINIC.

Miss T. D., aged 20, a typist, had dermatitis on both forearms and hands of five years' duration. She had received treatment elsewhere with ointments and the roentgen rays. Three months before presentation the condition recurred and proved intractable to treatment.

Examination at the Mayo Clinic on Sept. 2, 1927, showed a diffuse vesicular and bullous eruption of both hands and forearms. Microscopic study of the tissue in potassium hydroxide showed positive evidence of mycelial threads, probably trichophytes. Local treatments of various kinds had failed to check the advance of the process, new vesicles continuing to form at the borders.

DISCUSSION

DR. H. E. MITCHELL: I examined this patient for some time, and we took some vesicles from the palm. I looked at those two preparations for a while, and in the carefully selected material there was no mycelial thread to be found. Going over the past history of the patient and looking at the lesions as they are now it constitutes a picture of what we call eczematoid dermatitis. It seems to be made up of follicular elements, which become confluent, thereby producing a patch of weeping dermatitis. I am inclined to believe that it is due to a staphylococcus infection and external irritation.

DR. E. A. OLIVER: I have had an opportunity to observe this girl at intervals of a year for the past three or four years. I was much surprised to see her here today and glad to learn that the generalized eruption has appeared since her stay here. I have seen her at intervals with patches on the dorsal surfaces of either hand, possibly the size of a silver dollar, slightly scaling, and exhibiting a little moisture. I classified the condition as an eczematoid dermatitis, as Dr. Mitchell said. It usually cleared up on one-fourth unit of the roentgen rays and a white precipitate ointment.

DR. H. E. MICHELSON: This patient offers an opportunity for study in allergy in fungus infections. Trichophytin therapy might be a big help.

DR. E. P. ZEISLER: I agree with Dr. Mitchell's remarks and wish to say that sulphur should not be used in these cases.

DR. H. MONTGOMERY: When we first saw this patient, the appearance of the lesions on the hands was that of an eczematoid dermatitis. She was treated with various applications for several weeks without improvement. Dr. O'Leary then saw the patient and suggested that further search be made for trichophytes. Potassium hydroxide preparations at this time revealed definite mycelia and spores which could not be mistaken for anything else. Whether this was a superimposed infection, I do not know, but shortly afterward the eruption became generalized.

DR. P. A. O'LEARY: At the time the generalization started, it appeared as a papular eruption and remained so for some days. There has been a gradual coalescence of the papules and the production of the eczematoid picture. The sulphur baths were used after this developed, not before. It calls to mind the presence of allergy in these patients with ringworm of the hands. This extreme sensitiveness of the skin is also seen not infrequently in patients with trichophytosis who develop a dermatosis which resembles acute pityriasis rosea.

KERATOSIS SUPRAFOLLICULARIS (DARIER'S DISEASE). Presented by the MAYO CLINIC.

Miss J. H., aged 59, a glove operator, had a dermatosis of forty-six years' duration. There had been hyperkeratotic patches scattered over the body one place or another almost continuously since the time of onset. Once following an attack of influenza, about 1918, the scalp was quite free from the eruption. The condition was worse during summer and improved during the winter. No other disturbance of health was evident.

Examination showed a diffuse hyperkeratosis of the scalp, ears and face, except the nose and malar prominences, the process extending from the scalp over the forehead, and at the sides down the neck. There was involvement of the axillae and pudendum and the trunk at the waist and the back, especially between the region over the upper dorsal vertebrae. The palms and soles were thickened; the dorsa of both hands and feet showed a diffuse papular keratoderma; the flexors at both elbows and knees were involved. At the periphery of the patches there were discrete, subacutely inflammatory papules with a tendency to coalesce and merge their horny caps into a plaque of diffuse irregular keratoderma. Considerable fissuring and oozing were present, and there was marked pruritus at times.

The basal metabolic rate was plus 19. Hemoglobin was from 55 to 65 per cent. Red blood cells numbered 3,720,000. Other studies were negative. The stools showed cheilomastix mesnili.

Treatment had consisted of keratolytic applications, alkaline baths and Sitz baths, typhoid vaccine to the point of reaction, and roentgenotherapy locally. The patient had received roentgenotherapy elsewhere three years ago.

A biopsy specimen was shown.

THRUSH? LICHEN PLANUS? PEMPHIGUS? MOELLER'S GLOSSITIS? Presented by the MAYO CLINIC.

Mr. A. J. S., a laborer, aged 50, had lesions in the mouth, the tongue and mucous membranes of both cheeks, of from four to five years' standing. He previously had had all his teeth extracted and a tonsillectomy done, without beneficial effect on the condition. Local treatment elsewhere included roentgenotherapy.

Examination revealed a raw denudation of the anterior half of the dorsum of the tongue extending just over the anterior margin. The remaining tongue surface was scarred and smooth with total absence of normal glands and rugae. The mucous membranes of both cheeks were scarred, and there was some flaky white membrane at the border of the scars with radiating points and suggesting of striae. A green, slimy mucous accumulated over the affected areas. The

patient stated that there had been "blisters" at times, but these had always contained blood. Observation at the clinic revealed one small vesicle of herpetic type near the tip of the tongue—not diagnostic.

Lesions on the skin had been rare. The only one present was removed for biopsy from the right thigh. It was elliptical and purplish, with an atrophic center, and it had a slightly elevated border with brownish pigmentation. At one point was a group of small, coalescing papules with shiny flat tops. Biopsy showed mainly fibrosis; no evidence of lichen planus was seen.

Culture of the tongue was negative for *Monilia psilosis; Streptococcus viridans* was present.

Treatment at the clinic had consisted of antiseptic mouth washes, carbon dioxide snow and Kromayer light; arsenic had been given internally in the form of tryparsamide. The therapeutic response had been nil.

DISCUSSION

DR. E. P. ZEISLER: I favor the diagnosis of Moeller's glossitis. I think the prolonged, benign course rules out pemphigus, and the appearance is not that of thrush. The tongue was edematous and the tip brilliantly red.

DR. H. E. MICHELSON: It is to be noted that the condition was of five years' duration, and that the tongue was bound down with scar tissue. I have seen three patients with a balanitis which was similar to this condition. As the inflammation subsided, there was marked sclerosis, leaving the urethral orifice as a mere pin-point opening. This later condition was discussed by Delbanco, I believe.

RHINOSCLEROMA (TREATED). Presented by the MAYO CLINIC.

Mr. M. S., aged 28, was presented at a meeting of the Minnesota Dermatological Society in the spring of 1927. At that time he gave a history of lesions in the nose of eight years' duration. The diagnosis was rhinoscleroma, which was established by microscopic and cultural observations. Because of the marked involvement of the larynx, a tracheotomy was done. Roentgenotherapy had been employed.

The patient was presented to show results of treatment to date. The case was of unusual interest in that rhinoscleroma had developed in this patient of Slavic parentage, who was born in this country and who had never been out of the country.

A biopsy was shown.

A CASE FOR DIAGNOSIS. Presented by the MAYO CLINIC.

Mrs. P. L., aged 50, came to the clinic on October 19, because of lesions on the elbows, knees, ankles and feet of one and one-half years' duration. The following diagnoses had previously been made in Chicago: psoriasis, neurodermite, and eczema. The results of a general examination were negative, except for constipation.

The case was presented for diagnosis.

A biopsy was shown. The alcohol sections suggested psoriasis; the sections in a solution of formaldehyde suggested neurodermite. Potassium hydroxide preparations from lesions on the soles were positive for trichophytes.

DISCUSSION

DR. J. GRINDON: In this case the lesions were sharply outlined, and the patient said itching was severe. The appearance was that of a cross-wrinkling over the surface, something like the condition that Brocq speaks of as a capiage. It reminded me of a neurodermatitis. The distribution was entirely different from that I have been accustomed to see in that disorder, however.

DR. C. W. FINNERUD: I took care of this patient with Dr. Oliver at the Cook County Hospital, and at one time we considered psoriasis and used chrysarobin and other treatment commonly used in psoriasis, and everything made her worse. After studying the case for a considerable time, we came definitely to the conclusion that it was neurodermite.

DR. E. L. MCEWEN: I have been in contact with this case, and when I first saw the patient, the condition of the feet suggested the possibility of ringworm. I could not establish that diagnosis. The use of Whitfield's ointment accomplished nothing, or perhaps made the condition a little worse. It did not seem to me to be psoriasis, although the history she gave indicated that some who had seen her had believed it was. I thought it was a neurodermatitis. I could get no history of the use of phenolphthalein, and considered the possibility of food allergy. She is highly neurotic and could not tolerate any applications for more than a few days. During the time I saw her, a pair of severely inflamed tonsils were removed. Her condition today is considerably better than when I saw her last.

DERMATITIS VENENATA (TURPENTINE). Presented by the MAYO CLINIC.

E. R. P., a student nurse, aged 24, since March, 1929, had had recurrent attacks of dermatitis of the exposed surface, particularly the face, neck and hands. She had noted a flareup of the condition, especially on exposure to the odor of fresh paint or the preparation used for oiling floors. When she avoided these irritations, the attack would clear up except for lichenification of the soft tissue under the eyes. Applications of linseed oil and turpentine were made to the skin, and there was a marked reaction to the latter within half an hour, which persisted for a week or two.

DISCUSSION

DR. L. A. BRUNSTING: This patient is a nurse and is incapacitated for weeks at a time. Whenever she goes into a room that has been freshly painted, she suffers an acute exacerbation. Patch tests applied to the skin showed a marked reaction to turpentine within a few minutes. Raw linseed oil had no effect.

DR. H. E. MITCHELL: I have seen several cases of sensitization to the artificial turpentine commonly used in the paint today, but those patients were not sensitive to real turpentine.

LEPROSY. Presented by the MAYO CLINIC.

G. V. E., a man, aged 38, was first examined in the clinic on Oct. 4, 1929. A lesion on the forehead began four or five years before presentation as a linear discoloration. About the same time a lesion appeared on the left wrist. There were no subjective symptoms in the lesion on the forehead, except numbness. A year later, numbness developed in the radial side of the forearm. The patient was in service in Hawaii in 1918, and for ten days before discharge was quartered in native barracks. He had also been in Mexico for short periods, a few days at a time.

Neurologic examination showed palpable enlargement of the ulnar nerve. There was definite anesthesia for pain over the entire area covered by the lesion on the forehead. Repeated smears from the lobes of the ear and from the nodule on the hand, and six smears from the nasal mucosa were all negative for Hansen's bacillus. A biopsy specimen was shown.

DISCUSSION

DR. H. E. MICHELSON: At Carville acute exacerbations have been noted after the use of various medicaments, such as smallpox vaccine given subcutaneously. In the acute lesions many bacilli may be found.

DR. H. MONTGOMERY: Histopathologically, there are three types of leprosy. In the nodular or tuberose type, there are many lepra cells loaded with bacilli. The anesthetic type shows a perineural infiltrate, and the bacilli are often few and difficult to demonstrate. The case presented belongs to the third or tuberculoid type. The histologic picture closely resembled that of a sarcoid. The bacilli were demonstrated only after search through fifty sections. Gans has pointed out that in the tuberculoid type it is difficult to demonstrate the bacilli. This could be expected on account of its resemblance to the histopathologic picture of a sarcoid, in which we have the allergy to deal with.

DERMATITIS EXFOLIATIVA (ARSENICAL), SECONDARY ANEMIA. Presented by the MAYO CLINIC.

Mr. W. S., aged 59, since January, 1929, had experienced gradual extension of the present skin eruption which began as a small scaling patch over the forehead and extended peripherally. For the past six months the condition had been universally distributed.

Nothing definite was uncovered in the general examination to account for the condition, except the presence of arsenic in the urine, scales and hair, determined microchemically. The blood showed hemoglobin 50 per cent and the red blood cells numbered 2,980,000.

The patient was given several intravenous injections of sodium thiosulphate, which together with local treatment, was followed by gradual improvement. One month later the hemoglobin registered 70 per cent and the red blood cells, 4,200,000. Further questioning revealed the fact that the patient had moved his office into a paint shop and had put up new wall paper. Examination revealed a trace of arsenic in 2 Gm. of the wall paper.

The Wassermann reaction of the blood and other laboratory studies had been within normal limits. Tests of the stools were negative for parasites and ova. The progress of the skin condition had been favorable but rather slow and prolonged.

A biopsy specimen was shown.

DERMATITIS EXFOLIATIVA (ARSENIC?). Presented by the MAYO CLINIC.

Mrs. W. P. F., aged 63, a housewife, had a universal mild exfoliation of one year's standing. There was moderate pruritis, considerable scaling of the face and hands and occasionally some edema of the ankles. The disorder was first noticed by the patient as an irritation on the soles with oozing and fissuring which gradually spread to involve the whole body surface. She had received no medication elsewhere, except "Konjola." Her husband sprayed potatoes with arsenate of lead each spring, and had recently painted the house. There was no wall paper in her home.

General examination showed mild hypertension; obesity; dental and tonsilar sepsis (?); mild secondary anemia and arthritis of the left shoulder. The blood pressure was from 160 to 190 systolic and 100 diastolic. The laboratory data showed nothing significant except for presence of arsenic in the urine, 0.45 mg. in 700 cc.; in the hair, 0.1 mg. in 5 Gm.; in the scales, 0.0125 mg. in 100 mg.

Treatment had consisted of soothing baths and local applications with eliminatives. Intravenously, four or five injections of sodium thiosulphate, from 0.5 to 1 Gm. had been given. The response had been very slow.

A biopsy specimen was shown.

DISCUSSION

DR. H. E. MITCHELL: In talking with several members of the staff here, I found that there is feeling of lack of confidence in the use of sodium thiosulphate in exfoliative dermatitis of arsenical origin. I have a great deal of confidence in it. On inquiry I found that this patient had received only half a dozen injections at the most. I am inclined to believe that intensive daily injections, combined with sodium thiosulphate by mouth, would help these patients.

SUBACUTE LUPUS ERYTHEMATOSUS DISSEMINATUS, ACTINODERMATITIS BUCCAL MUCOUS MEMBRANE, SUBACUTE POLYARTHRITIS. Presented by the MAYO CLINIC.

Mrs. P. M., aged 46, an office clerk, married for two years, who had no children, was seen at the Mayo Clinic.

In 1920 a diagnosis of myxedema was made at the clinic, and treatment was instituted; consisting of thyroxin and later desiccated thyroid. Her basal metabolic rate had varied since from —30 to plus or minus 5.

The present illness was ushered in by septic sore throat and acute otitis media which led to radical mastoidectomy on the right side about ten months previous to presentation. Following this she developed polyarthritis and noticed erythematous papules on the forearms and face. In July, her dentist noticed white patches in the mouth, and she was later treated by radium applications to these areas, followed by considerable local reaction. There had been no loss of weight and no fever recently.

Examination on admission October 12 revealed erythematous plaques scattered over the bridge of the nose, both cheeks just anterior to the ears, over the upper sternum and on the dorsum of both forearms. These showed firmly attached scales, epithelial plugging and central atrophy. On the right thumb and right sole there were a few deep-seated tender erythematous papules. On the buccal mucosa there was a firmly attached white, milky membrane with an inflammatory zone at the periphery containing telangiectasia and areas of atrophy. There was general weakness, and movements were limited by arthritis.

The basal metabolic rate was plus 12. The laboratory data were otherwise negative.

Treatment had consisted of bed rest, and as much quinine sulphate as could be tolerated administered internally.

There was no evidence of myxedema at this time.

LUPUS ERYTHEMATOSUS: Presented by the MAYO CLINIC.

Mrs. C. E., aged 26, came to the clinic on Oct. 18, 1929, because of a rash on the left cheek of fourteen years' duration. When she was 12 years old, she noticed a small, soft, nonpigmented mole on the left cheek. Six years ago this was treated with acid, leaving a small scar, which she stated was the size of a dime. This scar gradually enlarged. The patient said that it itched and bled sometimes at night. The results of general examination were essentially negative,

A biopsy specimen was shown.

SUBACUTE LUPUS ERYTHEMATOSUS DISSEMINATUS WITH SYSTEMIC SYMPTOMS, GASTRO-INTESTINAL AND ARTICULAR. Presented by the MAYO CLINIC.

Mrs. B. B., aged 28, for more than two years, beginning soon after the birth of her only child, had had recurring gastro-intestinal upsets, nausea and vomiting, malaise and polyarthritis, with occasional periods of amenorrhea. About eighteen months before presentation she noticed papules on the nose and cheeks which merged and spread over the face with considerable local swelling. Treatment elsewhere with carbon dioxide snow had resulted in considerable local reaction followed by pigmentation.

The patient has been under observation at the clinic about four or five months, and was presented at the June meeting of the Minnesota Dermatological Society. Rest in bed and quinine internally were prescribed, the condition being too acute for treatment with a gold preparation. There were lesions on the face and the upper part of the chest, polyarthritis and marked lassitude. After some improvement injections of gold sodium thiosulphate were begun, about 25 mg. being given twice weekly for about twenty doses. No signs of intolerance developed. The skin cleared partially and the arthritis disappeared; there was increase in weight. During the last week of injections the eruption on the face flared up,

the only free area being a place on the lower lip. There was a recurrence of systemic symptoms. Treatment was stopped, and the patient was again put to bed and quinine given, with some improvement.

A biopsy specimen was shown.

DISCUSSION ON LUPUS ERYTHEMATOSUS

DR. E. P. ZEISLER: I noticed in the second case of this group a diagnosis of actinodermatitis of the buccal mucous membrane. It seemed to me a typical erythematous lupus, with involvement of the tongue.

DR. KARL ZWICK: The lesions on the hands and especially on the arms of the first patient of this group presented the appearance of the "net phenomenon" (signe du reseau) as described by Wickham in linchen planus. The lesions on the tongue were also not unlike those at times seen in lichen planus. Since the lesions on the face seemed typical of lupus erythematosus, one is tempted to consider the possibility of the simultaneous occurrence of both disorders in this patient.

DR. C. W. FINNERUD: We saw a similar case yesterday, and at the meeting a week or so ago in Chicago we saw two or othree others, all of which resembled both lupus erythematosus and lichen planus. Many of the papules on the backs of the hands are polygonal and flat-topped and have the striae of lichen planus; also, in the large patches on the face and neck these striae may be seen. These cases are confusing also because the lesions of lupus erythematosus which look clinically like lichen planus usually resemble that disorder histologically. I believe that especially because of the distribution of the lesions we are justified in classing such cases as lupus erythematosus. I think that treatment with a gold preparation will clear them up, whereas the use of bichloride and other treatment for lichen planus will fail. I have already watched the condition in one such case clear up under gold therapy.

DR. H. E. MICHELSON: I had the opportunity of seeing a patient with Dr. Freeman some time ago who had a fatal case of acute disseminated lupus erythematosus. The pigmentation of the face was most striking. Her skin was sepia brown. There have been several reports in the German literature on pigmentation and light sensitization in the acute form of this disease.

DR. H. MONTGOMERY: The histopathologic picture in that case was definitely that of lupus erythematosus and did not present the microscopic picture seen either in neurodermatitis or in lupus vulgaris.

DR. F. E. SENEAR: I though the case was perhaps made somewhat eczematous by applications. The patient had telangiectasis all about the periphery. We took off one of the scales, and it showed the characteristic studding, typical of lupus erythematosus.

ECZEMA (SEBORRHEIC). Presented by the MAYO CLINIC.

Mrs. H. A. S., aged 39, a housewife, presented a diffuse erythema, with fissuring, oozing and crusting, fairly generalized, involving particularly the scalp, ears, face (heavy yellow crusts on both lips), trunk and thighs. There was loss of hair of the scalp in patches, alopecia of the eyebrows, axilla and pubes. Ectropion with marginal blepharitis was noted. A diffuse, red, glazed appearance of the trunk and thighs was evident. A few pustules, but no vesicles were present.

The condition began about six years before presentation following the birth of her first child, with "weeping eczema" of both nipples, spreading peripherally and also involving the ears, scalp, axillae and groin. She had intermittent attacks for some time following. In 1923, she received some intramuscular injections of arsenic (?), following which the condition became universal, with total exfoliation, alopecia, loss of nails and amenorrhea for a year. Since that time it had never cleared up, the scalp, face, ears, axillae and groin being the sites of predilection. The patient told about "blisters" appearing between her fingers each summer for three successive years before the onset of the present trouble.

The Wassermann reaction was negative. Blood culture was negative. The stool showed no parasites and no ova. The blood picture revealed slight secondary anemia.

Treatment had consisted of sulphur baths, oils and soothing washes.

A biopsy specimen was shown.

DISCUSSION

DR. P. A. O'LEARY: When this patient first came under our care, she had definite bullous lesions which suggested the diagnosis of pemphigus of the foliaceous type. Further observation did not confirm such a diagnosis, however.

A CASE FOR DIAGNOSIS (LYMPHOBLASTOMA ?). Presented by the MAYO CLINIC.

Mrs. E. G., aged 62, following the menopause twelve years before presentation, had a scaling eruption of the hands and feet. This was much better at times, but the lesions had never entirely disappeared. There was marked pruritis at times, but no associated arthritis.

The patient injured the left leg three years previous to presentation. No ulceration resulted, but the area remained bruised for about a year. A year later she again injured her leg, and an ulcer appeared at the site of the injury which was refractive to treatment. In May, 1929, she had a "health bath," and a few days following this, multiple ulcers appeared on the leg; the condition had become progressively worse. She had been using lysol washes and an ointment locally prior to admission.

The blood count revealed 9,300 white blood cells and 3,950,000 red blood cells. The differential count was: lymphocytes, 14 per cent; mononuclears, 1 per cent, transitionals, 4 per cent, polymorphonuclear leukocytes, 79.5 per cent and eosinophiles, 0.5 per cent. Roentgenograms of the chest and of the leg were negative.

A biopsy specimen was shown.

DISCUSSION

DR. M. H. EBERT: We have seen this type of parapsoriasis-like lesions associated with a marked leukemic condition of the blood, in one case of some years' standing.

ACANTHOSIS NIGRICANS. Presented by the MAYO CLINIC.

Mrs. R. S. R., aged 23, was examined in the clinic on Sept. 2, 1929, because of stomach trouble of one and one-half years' duration. During the course of examination she was found to have latent syphilis. The Wassermann test of the blood and the Kahn test were strongly positive; examination of the spinal fluid gave negative results. She also had an exophthalmic goiter, the basal metabolic rate being plus 49, plus 24 and plus 22. Thyroidectomy was done on October 5; the pathologic report was colloid thyroid.

From the dermatologic standpoint the patient was of interest because of the lesions in the axillae, which she believed had been present since she was about 15. She had noticed an increase in thickening of the skin of the axillae and gradual increase in pigmentation. The latter had been diffuse and spotted.

Because of the patient's general physiognomy and type of physique, the question of endocrine disturbance other than that of the thyroid was raised. Roentgenograms of the chest, colon and stomach were negative, as was one of the sella turcica negative. Gastric analysis was normal.

The diagnosis was confirmed by biopsy, sections of which were shown.

CHRONIC ULCERATIVE PYODERMA ASSOCIATED WITH GENERAL DEBILITY. Presented by the MAYO CLINIC.

Mr. F. R., aged 51, a structural iron-worker, had not worked for eight years. He presented a large area of ulceration of ten years' duration of the perineum extending anteriorly to the inguinal regions and posteriorly to the sacral area

and the buttocks. The scrotum and testicles were gone, and fistulous tracts extended deep into the inguinal canals. The penis was shortened by scarring and contraction, but the glans was uninvolved. Abduction of the legs was limited. The anal canal was a scarred tube leading from the rectum to the ulcer and scarred tissue posteriorly. On the left calf, laterally, there was a similar area of ulceration or induration, extending from a point about 10 cm. above the ankle to 10 cm. from the knee.

The patient stated that the initial lesion appeared over the sacrum in the form of a "boil," breaking down and extending peripherally. The lesion on the leg developed after he had accidently scratched himself with his finger-nail. Progress had been sluggish on the whole. Sometimes a rapid advance of the lesion would occur, especially when his general health declined, with loss of strength and anorexia. There was no history of diarrhea, and no other significant history of diseases or injuries.

Physical examination otherwise showed persistent hematuria with marked secondary anemia (hemoglobin 40 to 55 per cent), infected tonsils, and a mouth full of snags and infected teeth. He refused cystoscopic study.

The ulcerations were peculiar in being roughly serpiginous in outline and extremely indolent, presenting a purplish advancing border characterized by an undermining process with edema and digestion of the subcutaneous tissue with secondary slough of the epidermis, and with a purulent discharge expressible from the border on slight pressure. No sinuses or miliary abscesses were present. The base was dull red with scanty granulations, covered by a slimy, mucopurulent exudate. Occasional areas of hypertrophic granulations with epithelialization were seen. There was healing both central and peripheral, by sluggish growth of epithelium, leaving thin superficial scars, friable and easily broken down with further ulceration and repetition of the process.

The Wassermann test of the blood was negative. Repeated cultures of the blood were negative. Cultures from pus showed *Staphylococcus aureus* and *Streptococcus hemolyticus* (anaerobic?). Microscopic examination was negative for blastomyces, yeasts or amebas. The stools were repeatedly normal. Inoculation of pus into healthy rabbits intracutaneously produced superficial abscesses with tendency to ulceration with spontaneous healing. Attempts were being made to inoculate dogs that had first been debilitated by the administration of phenylhydrazine.

Treatment consisted of local baths, assorted applications and skin grafts to the leg. General treatment included ultraviolet light, typhoid vaccine, highly nourishing diet, with a desultory response. Transfusion of the blood was about to be done.

A biopsy specimen was shown.

CHRONIC, ULCERATIVE PYODERMA ASSOCIATED WITH GENERAL DEBILITY, GASTRO-INTESTINAL DISEASE WITH ULCERATIVE COLITIS. Presented by the MAYO CLINIC.

Mr. E. M., aged 33, a farmer, had been unable to work for the past three years. For nine years he had recurrent crops of ulcerations of the skin, sparing no part of the body. These were usually preceded by a gastro-intestinal upset ending in bloody diarrhea and causing great debility. About two years before presentation the left ankle was amputated on account of traumatic crushing of the foot, with gas bacillus infection. The first ulcer began on the healed stump and crops of ulcers had appeared intermittently since, the longest free period being eight months.

From April to July of this year the patient was treated at the clinic during a severe attack of the ulcerations without much bowel trouble. The ulcers were peculiar in their appearance and clinical course. Advancing borders were undermined, edematous and purple red, and concealed considerable pus which exuded under pressure. There were no sinuses except in the vegetations produced by

the exuberant granulations when healing took place. Some of the lesions healed with practically no local treatment; others were intractable.

Treatment was devoted to building up the general resistance by means of a high calory, high vitamin diet, ultraviolet light and injections of mixed typhoid and paratyphoid bacilli to a point of reaction. When the general health declined, there was an exacerbation of the skin lesions and vice versa. The patient was dismissed July 7, showing activity in only one area on the right foot, the other lesions being healed and covered by thin superficial atrophic scars.

He was readmitted on Sept. 5, 1929, having had a severe gastro-intestinal upset ten days previously following the taking of some home-brew. This produced a diarrhea with blood and pus, some ten to twelve liquid movements daily. Three days after this upset the skin lesions reappeared, to progress in a fulminating course as before, appearing in scattered form over the entire body, including the scalp. The earliest lesions were follicular pustules with a zone of erythema as before; these enlarged and broke down and extended in the same peculiar manner as before, coalescing to form large denuded ulcerations.

Treatment was carried out as before, using besides local measures, injections of Bargen's serum for chronic ulcerative colitis. When the diarrhea ceased, the ulcers healed in rather short order with the same superficial type of scarring as before.

Repeated Wassermann tests were negative. Repeated blood cultures were negative. Blood picture showed hemoglobin to be from 45 to 65 per cent and red blood cells, from 3,000,000 to 4,000,000, waxing and waning according to the general condition. The urine was negative for bromides and iodides. Microscopic examination of pus showed no fungi and no ameba. Culture showed *Staphylococcus aureus* and hemolytic streptococcus, the latter growing best anaerobically in blood agar. Animal inoculations were performed. Guinea-pigs gave negative reactions for tuberculosis; rats, negative reactions for sporotrichosis. In rabbits, intracutaneous abscesses developed from which *Staphylococcus aureus* and hemolytic streptococcus were obtained. These abscesses healed after rupture, all the animals suffering no general symptoms. The rabbits given subcutaneous and intracerebral injections died. Examination of the stool showed blood and pus; no parasites and no ova were found on repeated search.

Biopsy sections and photomicrographs were shown.

CHRONIC ULCERATING PYODERMA, ULCERATIVE COLITIS AND SECONDARY ANEMIA. Presented by the MAYO CLINIC.

Mrs. W. M. M., aged 29, had been under observation in the hospital since the middle of June, 1929. For the past six or seven years, she had had bowel trouble. For one and one-half years she had had ulcerative colitis with bloody diarrhea. Nine months previous to admission, an ulcer appeared on the ankle, which extended peripherally by an undermining digestive process with considerable purulent exudate, resisting all local treatment. This proved to be the first of a series of ulcers, one appearing in January and another in March, the latter on the abdomen. Beginning as small pustules, these broke down and extended peripherally. Satellite lesions appeared and merged to form a large ulcer. At the time of admission the lesion extended entirely across the abdomen and reached from the pubes nearly to the umbilicus. The border was purplish red and elevated, and there was undermining of the active process, sometimes to a depth of 1 cm. There was considerable purulent discharge, particularly noticeable on pressure of the advancing edematous border. There was definite configuration of a serpiginous character. At the time of admission there was also polyarthritis. The left elbow joint became swollen, red and hot. Drainage elsewhere had resulted in a small ulcer being present for only two weeks.

Previous treatment had consisted of potassium iodide and sodium iodide given intravenously and roentgenotherapy locally. Repeated search elsewhere was negative for mycotic organisms. One blood transfusion had been given following

which there was a slight reaction but no definite improvement; 500 cc. of whole blood was given by the indirect method shortly after admission, following which there was marked improvement, and treatment with typhoid vaccine given intravenously was continued every few days to the point of reaction. The condition of the bowels improved, and the progress of the ulcerating skin lesions stopped. There was an increase of granular tissue, and a few islands of epithelium appeared. The patient passed formed stools for the first time in months. The hemoglobin increased from 40 to 65 per cent. Transfusion was repeated on August 16 after there had been a tendency to slip backward in general well-being and in the progress of the skin lesions, and there was definite improvement following. About September 1 blood and some pus appeared in the stools, and the ulcerations once more assumed an angry appearance, with rapid advance at the borders. Transfusion had not been repeated, but the bowel trouble had responded somewhat to intramuscular injections of Bargen's vaccine for ulcerative colitis. Local treatment had consisted of baths, particularly sulphur baths, the use of a great variety of wet packs, carbon dioxide snow to the borders, and application of Bezredka antivirus and bacteriophage, both by local application and by injection in the veins of the borders. As the general condition improved, the condition of the skin was better and vice versa.

Bacteriologic examination at the clinic had been negative for *Blastomyces* and other mycotic organisms and also for amebas. The stools had never shown amebas. Dr. Nickell isolated a hemolytic streptococcus which grew particularly well anaerobically—also a *Staphylococcus aureus.*

Microscopic sections of tissue with Gram stain showed many staphylococci and chains of streptococci deep in the cutis.

Biopsy sections and photomicrographs were shown.

DISCUSSION

DR. H. E. MITCHELL: I was much interested in seeing this group of cases because about four years ago I had a patient whom some of you may remember, a boy with a large area of ulceration on the left forearm. He was shown at the annual meeting of the Chicago Society, but excited little notice at that time because the impression was that the condition was tuberculosis. The history way that on the 4th of July of the preceding year the boy had a lesion like a furuncle on the forearm. This was followed by a breaking down. When I saw him, half the forearm was covered with an ulcerating area. The border consisted of a bluish-red undermined zone 1 cm. in width, the undermining progressed peripherally leaving a completely ulcerated surface with no intention of healing in the center. The organism proved to be *Streptococcus hemolyticus.* I had the boy in the hospital for a good while, and while there two attacks of lymphangitis occurred, with enlargement of the axillary glands. He was studied for a long time with the idea that it might be amebiosis. Large pus cells were observed on the warm stage, and after looking at them for a time, I thought I saw them moving, but was later convinced that I was mistaken. This boy was given autogenous vaccines, the lesion was irrigated with a solution of chlorinated soda and quartz light therapy was given, with complete healing and no recurrence. Later I saw a young woman with a similar lesion on the right cheek. She lived outside of Chicago, and I saw her for only ten days. Other reports of similar cases have appeared in the *Wochenschrift* in the last year or so, and I am sure it is a perfectly definite entity.

DR. W. H. MOOK: These cases correspond almost exactly to the series reported by Dr. Engman several years ago in which he found ameba to be present. We have not been able to classify them so far. The earliest case was seen at the Skin and Cancer Hospital in 1905, and in that the skin of the abdomen was involved. We have seen several cases since but have never made a diagnosis until about 1917, when a child, aged 3, came to the Skin and Cancer Hospital. The course was so different in the beginning from the later course of other cases that we thought the condition was new. It has a definite clinical picture in the beginning.

A small furuncle or ulcer develops and spreads rapidly, simulating migrating erysipelas. The edge is of violaceous or rainbow hue and breaks down rapidly. The ulcers spread rapidly over a large part of the trunk in many cases, and there are numerous lesions. About four of six patients died within a short time. In only one case were there gastro-intestinal symptoms. With this rapidly growing margin followed by healing in the center, with atrophic scars as the ulcer progresses, the condition is unlike any of the blastomycotic or other infections. We think it is a definite clinical entity.

DR. H. R. FOERSTER: We had this last patient under our care ten months before presentation, at which time she presented a different picture from the one shown today. There was a history of pyoderma over a five months' period, and examination showed two active lesions. One, situated on the upper outer thigh and of several weeks' duration, had the appearance of an involuting ulcerated gumma and healed within a week following roentgentherapy and potassium iodide medication. The second lesion, situated below one of the external maleoli, was an infiltrated granulomatous plaque with numerous sinuses yielding a chocolate colored pus on pressure. We considered the possibility of an atypical sporotrichosis or blastomycosis, but were unable to obtain evidences of fungi by repeated smear or culture. *Staphylococcus aureus* was obtained repeatedly in pure culture, but we did not consider it pathognomonic. Because of a severe secondary anemia, attributed to an ulcerative colitis, a transfusion of blood was carried out. Following this fever developed, which continued about a week, and was associated with the appearance from day to day of erythema-nodosum-like nodules in the vicinity of the knee, elbow and ankle joints and on one cheek. At this time we considered the possibility of a low grade bacteremia, though blood cultures were negative and material aseptically removed from centrally softened nodules remained sterile. These lesions involuted slowly, and when the patient left the hospital, only the lesion on the ankle, which had not entirely healed, still showed some activity. Our conclusion was that we were dealing with a low-grade bacterial or mycotic infection which the patient was unable to overcome because of the debility occasioned by an ulcerative colitis.

DR. W. H. MOOK: An early diagnosis is important. We found the best treatment to be excision with the cautery knife, but that is impracticable when the lesions are large.

DR. R. S. WEISS: I have seen most of the cases in St. Louis, and I want to confirm what Dr. Mook said about the diagnosis. About a year ago, I was called to see a patient who had had purulent appendicitis; an operation had been performed and drainage instituted. At the margin of the sinus an ulcer had developed, which the patient said began like a boil. This did not heal, but spread slowly until the entire abdominal wall was covered by an ulceration similar to that displayed by this patient with the ulcers on the abdomen. The edges were similar, and on making smears, not from the pus that exuded from the lesions but by going in deeply at the border, we were able to demonstrate active, motile amebas which we could not classify. There was no previous history of diarrhea or infection of the intestinal tract, with the exception of the symptoms of acute appendicitis, which were relieved by the operation. This patient recovered on treatment with emetine hydrochloride, a brand of acetarsone (stovarsal), application of carbon dioxide snow to the edges of the ulcers and finally cautery excision of a small ulcer which remained after the rest of the ulcers had completely healed.

In searching for the ameba, it is not well to use pus from the center of the lesions or from the margin; one must go in deeply beyond the edge. It might be well to use a capillary pipet. The amebas are in the lymph channels beyond the edge of the obvious lesion, and possibly by making a preparation from the deep undermined edges, the organism might be found. Clinically these cases closely resemble the group Dr. Engman described.

DR. H. E. MITCHELL: All of these methods of securing the ameba were followed, and I used one method which is somewhat similar to the method of

looking for the Donovan bodies. I cut off a part of the undermined border and squeezed out the tissue there, but no amebas could be demonstrated.

DR. J WIEDER: In our patient the ulceration extended to the lesions of the colon. During the febrile attacks we took blood for cultures, with negative results.

DR. H. R. FOERSTER: This discussion brings to mind a case I saw eight years ago that belongs in this group. The patient developed chronic ulcerative granuloma following an abdominal operation. This lesion recurred three times in spite of energetic local treatment. Intensive ultraviolet irradiations contributed to the final healing. The only organism isolated was a coccus. I believe that these cases under consideration constitute a distinct entity of infectious disease, apparently pyogenic in origin, and to be distinguished from the amebic infections referred to by Dr. Mook and Dr. Weiss though closely resembling that group.

DR. P. A. O'LEARY: We have had eight of these patients under our care during the past few years. The possibility that these cases were examples of cutaneous amebiasis has been constantly under consideration, but we have been unable to demonstrate the ameba in any of them. Seven patients had colitis as a prominent complication. The colitis was of the so-called Bargen type, but no pathologic amebas were found in the stools.

The three cases presented today manifest three aspects of the disease. The patient whose foot was amputated has done well and continues to do so while under hospital care, but when at home he developed a recurrence of the colitis, followed in two or three weeks by the appearance of the cutaneous lesions. The patient minus a scrotum has been the most resistant to treatment of any of the group, and thus far little has been accomplished for him. The ulcer on the abdomen of the young woman was practically healed several weeks ago. A gastro-intestinal upset was followed by a severe attack of colitis, and in a few days the ulcers flared up and spread rapidly.

The ulcerations have impressed me as those of pyoderma. The presence of the colitis and the parallelism between the cutaneous and the intestinal disease are apparent. I am not prepared to say that the streptococci obtained from the ulcers and from the bowel are identical. We have produced similar ulcers in laboratory animals by injecting material collected from the borders of ulcers, but they heal readily. We are in the process of debilitating some laboratory animals and then plan to inoculate them in an effort to reproduce the disease. I agree with Dr. Harry Foerster that the ulcerations are produced by common bacteria in patients who are greatly debilitated by a gastro-intestinal infection, and treatment must be directed primarily to this gastro-intestinal disease, following which the cutaneous lesions heal spontaneously.

DR. H. MONTGOMERY: In all the cases of pyoderma serpiginosum, sections stained with Rosenow's modification of the Gram stain showed the presence of staphylococci or streptococci deep in the cutis. One case showed massive collections of streptococci in the deeper portions of the cutis. Serial sections failed to show any sinus leading down to these collections. In all cases a careful search with suitable stains was made for blastomycetes, tubercle bacilli and amebas, but none were found.

DR. M. H. EBERT: I am interested in the association of this sort of lesion with the gastro-intestinal symptoms of colitis. I had an opportunity to study an unusual case of it two years ago in Dr. Ormsby's service in a man with an extensive ulceration of the abdominal wall. While under observation this partially healed spontaneously, but it recurred, and there were large areas covered by ulcers not only on the trunk but on the extremities. The ulcers were different from any I had seen. When active, the epidermis at the margin was separated and raised, and if one broke it down, one found that the dermis was melted away at least one-fourth inch beyond the area that was affected on the surface. The description that fitted that case best was that of the group described by Engman, and we searched for the ameba, but were never successful in finding it. The interesting thing about the case was that the patient was suffering from

colitis, and also bleeding from the bowel to the extent that the hemoglobin and the red blood count were low. Exacerbations of the skin lesions coincided with the exacerbations of the bowel condition. The patient finally became practically moribund, and we began transfusions of blood. Whether it was due to that or not, the lesions began to clear up, and within a short time all of them healed spontaneously, the hemoglobin began to rise, and the man left the hospital in good condition. The physicians in the gastro-intestinal department studied the bowel condition but were unable to make any diagnosis except colitis.

DYSGENETIC DISTURBANCE: SEBACEOUS GLANDS, HAIR AND TEETH. Presented by the MAYO CLINIC.

S. E., a girl, aged 4, since the age of 2 years had been developing small nodules in the skin, chiefly on the face and forehead. These nodules were filled with cheeselike material. The mother has been opening them and pressing out the contents.

An older brother of the patient had similar nodules. The father and mother were not related; the grandparents on either side were not related. The hair of two older brothers developed rather late, and at present was dry, harsh and sparse. There were five children in the family, all of whom developed teeth after 11 months of age. The father also had a similar condition during early childhood.

Examination showed the face and forehead to be studded with firm, round cystic nodules of varying size.

DISCUSSION

DR. H. E. MICHELSON: Dr. Montgomery has made a clear histologic diagnosis. We should call attention to the fact that there are two types of xeroderma pigmentosum, the early more malignant type and the later mild type, which might be called a premature cutaneous senility.

CHICAGO DERMATOLOGICAL SOCIETY

E. A. OLIVER, M.D., *Secretary*

Regular Meeting, Oct. 16, 1929

H. R. FOERSTER, M.D., *President, Presiding*

MULTIPLE CYSTS RESEMBLING XANTHOMA. Presented by DR. O. S. ORMSBY.

A man, aged 28, presented a fairly generalized eruption. Five years before presentation, the first lesions were noted on the chest, and new ones had continually appeared. There was no sensation. The patient said that occasionally a lesion became inflamed and tender for several weeks, then broke down and discharged pus and blood, leaving a scar. Some of the lesions had been cauterized. The patient was in excellent health in every other way.

Examination showed numerous hemispherical, raised nodules, varying in size from that of a match-head to that of a split-pea, which felt moderately firm. The skin over them was not altered. Some of the lesions were bluish and translucent; many were yellow. There were a few scars from old lesions. The majority of the lesions were situated on the trunk, especially on the anterior surface. Those on the extremities were less numerous and smaller and more of them were yellow. The contents, taken from one of the lesions that had been aspirated, proved to be sebaceous material.

Histologically, the cystic nature of the nodules was evident, but their nature had not yet been worked out.

DISCUSSION

DR. J. H. MITCHELL: I saw a case somewhat similar to this one last spring, with lesions limited to the upper part of the chest. They were quite numerous and exactly like the ones in the case presented. I opened some of them and found them to be sebaceous cysts.

DR. H. R. FOERSTER: This patient recalls to mind a similar case under my observation. There were numerous lemon yellow nodules distributed chiefly in the areas of most active development of sebaceous glands. Some of these lesions were found to be cysts.

DR. O. H. FOERSTER: The striking thing about this particular case is its resemblance to xanthoma, especially when we consider that the localization of the lesions is in the region in which we most often find syringocystoma. My first impression was that we were dealing with an unusual type of syringocystoma, and until further studies have been made, particularly biochemical, and the contents of the lesions have been examined, I should think of syringocystoma as a tenable diagnosis.

DR. C. W. FINNERUD: In ordinary formaldehyde or alcohol fixation and paraffin mounting, the content of these cysts becomes very hard and impossible to cut, but in several of the sections hematoxylin-eosin stains show some remnants of structures of the sebaceous glands in the wall of the cyst, analogous to the observations in the case presented last year by Dr. Ormsby. Because the center shelled out, we were unable histologically to study the case properly so sections are now being run through by the slow celloidin method in the hope that by this procedure we shall also be able to study the content of the cyst.

DR. RUBEN NOMLAND: The study of the frozen section did not turn out well, but there is a definite cyst about the size of a pea, with a definite wall. The contents stained dark red with sudan III, indicating sebaceous or fatty material.

DR. O. S. ORMSBY: This patient was presented on account of his unusual lesions and because a similar case was shown a year ago. The latter case was definitely cystic and connected with the pilosebaceous system. The present case resembles xanthoma tuberosum and syringocystoma. Only a few similar cases are on record. One resembling this, but differing histologically, was reported in 1891 by Pollitzer as multiple dermoid cysts. His case had previously been recorded by another reporter as xanthoma tuberosum. The present case, together with the one shown a year ago, is to be worked up and recorded later.

ERYTHROSE PIGMENTAIRE PERIBUCCAL (BROCQ). Presented by DR. O. S. ORMSBY and DR. M. H. EBERT.

A woman, aged 31, presented a disorder on the face of eight years' duration, which had become more marked during the last year. The condition was accompanied by burning and smarting sensations which were more noticeable at the menstrual period. During the year previous to presentation, the patient had had some hair on the chin epilated with the electric needle. Her face flushed easily. Her menstrual periods were irregular and the flow was scanty. She had been pregnant only once and was delivered of a stillborn child at that time. The patient was short, stocky and somewhat overweight. There was a moderate amount of hypertrichosis. On her first visit the blood pressure was 210 systolic and 100 diastolic. On her last visit, this had diminished to 160 systolic and 90 diastolic.

About the mouth and chin and extending on the nasolabial folds there was an irregular retiform, yellowish-brown pigmentation. There was no scaling. The skin was somewhat oily.

DISCUSSION

DR. M. H. EBERT: This case is particularly interesting to me because I happened to see one in Paris that was very similar and the same diagnosis was made there. Brocq was the first to describe the entity, and it has certain

peculiarities that he pointed out. One is that the pigment varies from day to day and even from hour to hour. That fact was excellently demonstrated in the case presented. The pigmentation apparently is not due to the deposit of melanin, because under glass pressure it readily disappears.

Another point is that in the pure cases of this disorder there is no scaling. It is not a variety of seborrheic dermatitis. It has been pointed out by Sabouraud and Brocq that this is one of the disorders that has to do with the circulation of the face and as such is usually found in persons with dysfunction of the gastro-intestinal tract or of the glands of internal secretion. In this patient there is nothing worthy of note in the gastro-intestinal tract, but, as far as we can determine, she has dysfunction of the glands of internal secretion. She is considerably overweight, her menstrual bleeding is scanty and she has hypertrichosis of the chin, which is not very visible because it has been treated by the electric needle and epilation. She also has a masculine type of hair growth on the body.

LICHEN PLANUS. Presented by DR. A. W. STILLIANS.

A Jewish scrubman, aged 57, noted an itching eruption on his hands five weeks before presentation, and ascribed it to the irritation of washing powder. When first seen, the papules were large, ranging up to 0.7 mm. in diameter, many of them covered by a dull, yellow, horny crust. At the time of presentation, they had become smaller, and the horny crusts were not to be seen. The backs of the hands and both surfaces of the wrists were involved, and there were several small patches of papules on the buccal mucosa, one of them being circinate.

DISCUSSION

DR. C. W. FINNERUD: I think that this is a case of lichen planus obtusus, similar to the case presented at St. Louis, but with a different localization of the lesions.

DR. A. W. STILLIANS: I showed the patient because of the peculiar character of the lesions and the localizations on his hands, possibly connected with his work.

A CASE FOR DIAGNOSIS (PIGMENTATION, MERCURIAL?). Presented by DR. MARION S. FINK (by invitation).

A woman, aged 46, presented a bluish-black pigmentation limited to the eyelids, the furrows across the bridge of the nose and forehead, the nasolabial folds, the angles of the mouth and the neck. She said that the disorder began approximately three years previously and had gradually progressed. She gave a history of some liver, abdominal and pelvic trouble about five months before presentation, for which she received radium and roentgen therapy.

She had been engaged in photography in all of its branches for twenty-eight years.

DISCUSSION

DR. L. A. BRUNSTING: The case presented suggests very much the group of cases described by Dr. Goeckerman which were due to mercurial deposits caused by the long-continued use of creams containing mercury. This woman gave a history of having used "Cremola" and other face creams. The most common offender has been the "Oriental" cream. I am not familiar with the preparations that this patient used. The dull blue color of the pigmentation, arranged chiefly along the lines of cleavage, fits in well with the cases described.

DR. C. J. WHITE: While Dr. Stillians was away on his vacation, I saw a patient for him who presented a similar eruption that had appeared after the use of a certain cold cream. I had the preparation analyzed by a chemist who found only sulphur. But the pigmentation was very similar to that of the patient presented. Dr. Goeckerman could not give me any information about this patient. I had considerable correspondence with him in regard to her.

DR. O. S. ORMSBY: Dr. Goeckerman reported that they found the metal in the corium.

DR. MARION S. FINK: The possibility that this patient's occupation had something to do with the disorder occurred to me. I have never heard of a case of argyria in photographic workers, and as the field is so large especially in connection with the roentgen ray, I think that we should have heard of them had they occurred. The patient admitted that she is careless about the use of chemicals, and there is a question whether there might be a precipitation of chemicals in those areas. She uses hyposulphite and sulphur, and this occurred to me as a possible cause of the disorder. The only other explanation was the use of cosmetics.

I should like to know whether Dr. Stillians has recognized this localization in cases of argyria.

DR. A. W. STILLIANS: I have never seen such a localization in argyria. The eruption is usually quite diffuse, and in my experimental work one injection into the arm spread out over a large area, so that I believe such sharply confined patches are not possible in argyria.

LEIOMYOMA CUTIS. Presented by DR. O. S. ORMSBY.

A man, aged 38, had a disorder of three years' duration. The first lesion noted was the large one, now in the center of the patch, and others gradually appeared. At present there is a patch of nodules the size of a palm, situated in the intrascapular region to the left of the midline. The nodules were reddish brown and oval and varied in size from that of a pea to that of a bean. They were arranged in parallel rows in the patch. No sensations were present except in the largest lesion in the center of the patch, which was sensitive to cold.

DISCUSSION

DR. O. S. ORMSBY: This case was presented to call attention again to a disorder that until the past few years rarely appeared. Now they are appearing more often and are easily recognized.

A CASE FOR DIAGNOSIS (DEVERGIE'S DISEASE? SEBORRHEA RUBRA?). Presented by DR. F. E. SENEAR and DR. M. S. WIEN.

A girl, aged 6, presented an eruption of the face that first appeared at the age of 2 years. Redness was first noted on the upper lip and in the region of the eyebrows, and small pinpoint spots were scattered through the involved areas. The patient had had pneumonia at the age of 18 months and since that time had had a persistent nasal discharge. She was otherwise in good health. The skin eruption was not associated with any subjective sensations. There had been sparse development of the eyebrows.

The patient presented a diffuse pink blush in both supra-orbital regions, involving the region of the eyebrows and extending across the midline to involve the glabellar region and lower midportion of the forehead and chin. The upper lip was similarly involved. The pink areas were seen to contain numerous glistening papules, the size of a pinhead, which appeared like beads of perspiration and gave a definite sense of resistance — a nutmeg grater feel — on palpation. The buccal surface of both lips contained scattered translucent bodies, the size of a pinhead, which appeared like small mucous retention cysts.

DISCUSSION

DR. M. H. EBERT: As a diagnosis, I wish to offer ulerythema ophryogenes. The lesions were minute papules that appeared as though they were follicular. This appearance, the permanent epilation of the eyebrows at the outer margins and the suggestions of atrophy in that area gave me the impression that the condition might be that form of disorder.

DR. H. R. FOERSTER: I think that we should give consideration to two things in addition to those mentioned. One is lichen ruber accuminatus in the early stage, which frequently begins on the scalp and remains localized there for a long time, manifesting itself chiefly by profuse scaling which is mistaken for dandruff, then appearing in scattered patches of tiny papules, accuminate in type, situated frequently in the region of the eyebrows and on various parts of the face. The lesions in this case appeared to me to be too small for that disorder, and although there is scaling on the scalp it is not of the flourlike type seen in lichen ruber acuminatus or Devergie's disease.

The other disorder I considered was the condition described by Engman as seborrhea rubra, in which there is a minute follicular papule, the lesions being very closely set and giving the impression of emory paper when rubbed with the finger. This disorder is of a peculiar dusky redness, and is located chiefly about the chin and the mouth. In Dr. Senear's patient there is an associated hyperhidrosis, and the condition is not sufficiently clear for me to venture a definite diagnosis.

DR. F. E. SENEAR: We have had no definite ideas on the subject, but have not been able to get away from the thought that perhaps the condition belongs somewhere in the nevoid group. We have not seen anything like it. We have been reluctant to attempt a biopsy because I doubt whether we would do anything except satisfy ourselves, and I dislike to scar the patient's face. We examined the mucous membranes and she apparently has an overdevelopment of the mucous glands, and a few lesions in the mouth of the type designated as Fordyce's disease. I think that there is possibly a connection there.

NEVUS (KERATO-ANGIOMATOUS). Presented by DR. E. P. ZEISLER.

A boy, aged 6, presented multiple angiomatous and keratotic lesions, about the size of a coin, around the left knee, which began at the age of 18 months and gradually spread and enlarged.

The patient was presented because of the combination of angiomatous and keratotic elements. There was also a subcutaneous angioma underlying the cutaneous lesions.

DISCUSSION

DR. J. H. MITCHELL: Some of the lesions appeared to be lymphangioma.

DR. H. R. FOERSTER: I consider this condition both lymphangioma and lymphhemangioma with hyperkeratosis.

DR. C. W. FINNERUD: From the appearance in this case, I think that the lesion is purely a lymphangioma, although recently we studied a lesion histologically, which was grossly practically identical to this one and found it to be an hemolymphangioma.

SARCOID. Presented by DR. E. A. OLIVER.

A negress, aged 49, presented an eruption that had been present for about twenty months. The first lesion appeared on the left side of the nose.

Examination showed an area, the size of a dime, on the upper lip, a number of lesions, varying in size from that of a pinhead to a small pea, about the ala nasi, and several lesions, varying in size from that of a pinpoint to that of a pea, about the canthi of the eyes. The lesions were firm and reddish brown and were devoid of any subjective sensation.

DISCUSSION

DR. O. S. ORMSBY: We saw this patient years ago, and Dr. Mitchell took photographs of her condition. We published the photographs at that time as lupus miliaris facei disseminata. I think that the condition is tuberculosis of the skin with clinically different types of lesions, some resembling lupus, others sarcoid.

DR. J. H. MITCHELL: I was pleased to see this patient. Dr. Nomland and I saw her one day last summer, and I told him at the time that I remembered the condition as similar to or the same case Dr. Ormsby and I saw years ago. It is interesting in that it shows how sarcoid may have its origin.

DR. H. R. FOERSTER: If I recall this case correctly, when the patient was exhibited at a meeting of this society several years ago, she presented lesions of lupus miliaris, the size of a pinhead, on the face.

DR. C. W. FINNERUD: When Dr. Oliver first saw this patient in the dispensary of St. Luke's Hospital several weeks ago, some of the lesions were the size of hazelnuts. The largest four have since been excised for cosmetic reasons. We ran histologic sections of some of these and of several of the smaller lesions at the Cook County Hospital and at Rush Medical College. In none of these was there good evidence of lupus vulgaris, but in all there were very good pictures of sarcoid. In the sections shown, there was a very occasional giant cell. Strangely, two well known general pathologists made a diagnosis of nevus.

DR. M. H. EBERT: I wish to know whether or not the tuberculin test has been made. If not, it would be interesting to make one, for both types of lesions give a negative reaction to tuberculin.

LUPUS ERYTHEMATOSUS DISSEMINATUS (SIMULATING LICHEN PLANUS). Presented by DR. C. W. FINNERUD.

A man, aged 33, had an eruption of the face, neck, lips, mouth, back of the hands and front of the legs of three months' duration. It began on the right side of the face as what he thought was sunburn and soon spread to involve the other facial areas. After about six weeks it spread to the other areas. He said that at times there was a slight itching sensation in the lesions. About ten years prior to presentation he had had an eruption limited to the flexor surface of the left forearm which he thought was the same and which cleared up with eight injections given intragluteally, at the Central Free Dispensary. He said that he was told then that the disease was lichen planus. (The old record was not found.) The patient had had no tuberculous manifestations and gave no history of any other serious illness.

Examination showed collodion-like involvement of the vermilion border of the lips, streaked, discoid and circinate whitish thickenings of the buccal mucous membrane, diffuse and patchy erythematous plaques of the face, neck and ears and striae giving the lesions on the neck and some of the lesions on the face somewhat the appearance of lichen planus. Papules, some of which were umbilicated, were numerous on the backs of the hands; most of these were striated and therefore also suggestive of lichen planus.

Histologic sections from a patch on the neck stained with acid-orcein-hematoxylin and with hematoxylin-eosin showed a picture more compatible with that of lupus erythematosus than that of lichen planus, there being rather a scant cellular infiltration of the papular portion of the corium, that present, for the most part, not being sharply defined. There was perivascular cellular infiltration in the deeper portion of the corium. Apparently the elastic tissue was abnormal, fragmented and scanty in certain portions of the papillary corium, and above these areas the epidermis was somewhat thinned, whereas in other areas it was definitely thickened.

DISCUSSION

DR. E. P. ZEISLER: This is an interesting case of the subacute disseminated variety of lupus erythematosus, with a striking resemblance to lichen planus. I wish to speak a word of caution about the use of gold compounds in these cases. I had one experience recently in an erythematous lupus that developed an acute hemorrhagic type of disease following the use of a gold compound. The lesions were not as disseminated as in this case, but there was an acute reaction. The first dose used was 50 mg., with no reaction. The second dose was 100 mg.,

and this was followed within twenty-four hours by an acute reaction that I feared would be fatal.

DR. S. W. BECKER: The histologic picture is more nearly that of lichen planus than that of lupus erythematosus. The extensive thickening of the stratum granulosum, evidenced clinically by the opaque lesions on the neck, and the loose character of the scales seem to point toward lichen planus.

DR. M. H. EBERT: The elastic tissue stain shows a destruction of the elastin.

DR. H. R. FOERSTER: On both clinical and histologic evidence, my impression of this case favors consideration of lichen planus, though I appreciate the arguments in favor of the presenter's diagnosis.

DR. C. H. FOERSTER: It is my opinion that this is an instance of erythematous lupus, resembling lichen planus clinically as well as histologically, but I think that various features in the section, particularly the absence of demarcation of the infiltrate, would show that it is an erythematous lupus. The case demonstrates, furthermore, how closely one disease may resemble another.

DR. J. H. MITCHELL: I am frank to say that I would not have thought of lichen planus from the lesions on the face. The demarcation and, particularly, the scaling on the ears would suggest lupus right away. Also I thought that the lesions on the vermilion border of the lip were characteristic.

DR. C. W. FINNERUD: This case was shown because of its similarity to both disorders, and it seems to me that it is on the side of lupus erythematosus. I have wondered if the four, five or six similar cases which have been shown during the past few years are not all definitely lupus erythematosus. It has invariably been the sites of this disorder that have been selected in each instance. In lichen planus we almost never seen lesions on the face, and in these cases practically all the lesions have been on the face and neck. For the most part, they are large, diffuse patches, and I think that this alone speaks strongly for lupus erythematosus. We have not used any treatment in this instance, for we did not wish to alter the appearance of the disorder before presenting the patient. I think, however, that we can clear it up with gold sodium thiosulphate, beginning cautiously, although this case appears as one of lupus erythematosus that might react unfavorably to that drug.

In some places the infiltrate is sharp, as might be expected in lichen planus, but histologically there seems to be more evidence of lupus erythematosus than of that disorder. I believe that a gold compound rather than mercuric chloride will eradicate the eruption.

GRANULOMA ANNULARE. Presented by DR. J. H. MITCHELL and DR. RUBEN NOMLAND.

A well developed negro child, aged 3, had a lesion on the dorsum of the foot which had been present for four months. It began as a small, subcutaneous nodule which enlarged slowly peripherally. Two smaller lesions were seen, one on the left knee and the other on the right elbow, each about 1 cm. in diameter. The child's general health was good, and there was no subjective symptom. The Wassermann reaction of the blood was negative.

The chief lesion was about 3 cm. in diameter and round, with a depressed center and an elevated border.

A biopsy from the edge of the lesion showed the epidermis and upper cutis to be normal. The middle cutis, at about the level of the sweat glands, was the site of a rather marked perivascular cell infiltrate composed of round cells and a few plasma and fixed tissue cells. In the deeper cutis was a granuloma, made up of lymphocytes, epithelioid, plasma and fixed tissue cells. Here and there in the granuloma were remnants of the necrotic appearing connective tissue so characteristic of granuloma annulare. Acid-orcein stains revealed destruction of the elastic fibers where any cell infiltrate was present. Most of the vessels showed a slight thickening of the intima.

DISCUSSION

DR. H. R. FOERSTER: I think an interesting point in this connection is that the lesion on the foot did not disappear, even though a piece was removed. So frequently we read and hear that if a biopsy is done on lesions of granuloma annulare, they disappear. I do not recall ever having seen that occur.

DR. J. H. MITCHELL: I saw this boy one day last summer on the occasion of his first visit to the clinic and demonstrated it as a case of granuloma annulare.

KERATODERMA (ACQUIRED). Presented by DR. S. W. BECKER (by invitation).

A man, aged 63, an employee of the elevated railway, fell across the third and second rails two years before presentation. Burns resulted on the right hand and right leg. Following this, he noted thickening of the palms, points of pressure on the soles and thickening of the skin beneath the free borders of the finger-nails and toe-nails. More recently, the skin over the knuckles had become thickened. He said that no medication had been given and that he had always been healthy.

The skin over the palms and palmar surfaces of the fingers was thickened and yellow. The finger-nails were thickened and elevated by an accumulation of epidermal débris beneath the free border. The points of pressure on the knuckles also showed hyperkeratotic epidermis. On the heel and ball of the feet the skin was thickened and yellow. The toe-nails were involved in the same manner as the finger-nails. Neurologic examination had not yet been made.

DISCUSSION

DR. C. W. FINNERUD: I heard some one remark that because of the involvement of the nails there might be two disorders present. I think that the type of change present in the nails would be compatible with keratoderma.

DR. J. H. MITCHELL: I have a Christian Scientist under observation with keratoderma of both soles and with changes in the nails very much like those in this case, and in addition there was a ringworm infection between the toes, manifested by macerated areas and fissures. I tried to find the organism in the keratotic areas on the heels and soles but did not succeed, although they were present in the nails and interdigital spaces. I advised the use of chrysarobin in traumaticin (solution of gutta percha N. F. IV) over the areas and they cleared rather rapidly. Whether or not they were due to a fungus I cannot say, but they yielded quickly to simple external applications.

A CASE FOR DIAGNOSIS (ATROPHY, SYPHILITIC?). Presented by DR. M. H. EBERT and RUBEN NOMLAND.

A woman, aged 35, presented a skin disorder on her right forearm which had been present for five years. She was first married at the age of 16, and had one healthy child, who was living at the time of presentation. A second marriage was contracted about twelve years later, followed by two miscarriages. She did not recall the exact development of the cutaneous disorder, but thought that it started on the dorsum of the hand and near the elbow at the same time, both patches slowly enlarging, to coalesce. There was mild itching on some occasions. Recently she had received eighteen injections, of an unknown nature, with no improvement in the condition. The Wassermann reaction of the blood was negative. An intracutaneous injection of 1:1,000 old tuberculin was positive.

The lesion occupied the dorsal and ulnar aspects of the right arm, extending from above the olecranon down to the fourth and fifth knuckles. Its width varied from 2 to 12 cm.; the margins were poorly defined but definitely circinate. The appearance varied in different portions of the lesion. Over the olecranon and metacarpals there was marked atrophy which had affected the subepidermal tissue chiefly and the epidermis only slightly. Atrophy of a lesser degree was present throughout the lesion. Most numerous at the borders were a number of soft,

reddish, subepidermal, infiltrated nodules, about 1.5 cm. in diameter. The entire area presented a reddish-brown, mottled pigmentation.

One of the infiltrated nodules was removed for microscopic examination. Sections were stained with hematoxylin-eosin, Pappenheim's method, polychrome methylene blue and acid-orcein-hematoxylin. The epidermis showed very slight atrophy. The upper dermis was the site of a dense, diffuse infiltration consisting of small round cells, numerous plasma cells and an occasional mast cell. A narrow band just beneath the epidermis (grenz zone) was free from infiltration. The diffuse infiltrate ended rather abruptly slightly above the level of the sweat glands. In the deeper cutis the infiltration was perivascular and consisted of round and plasma cells which were occasionally arranged eccentrically about the blood vessels. The intima of the deeper vessels was thickened. In one or two places the intima had proliferated to such an extent that the vessels were almost obliterated. The elastic tissue had been destroyed by the infiltrate.

DISCUSSION

DR. DAVID LIEBERTHAL: I thought that the case was one of atrophoderma, the etiology of which may possibly be ascertained.

DR. O. S. ORMSBY: This patient was presented a few days ago as one with atrophy due to syphilis and resembling idiopathic atrophy. In this instance, the lesions were asymmetrically placed, whereas a bilateral distribution is the rule in the idiopathic cases. The histology here bears out the clinical diagnosis.

DR. M. H. EBERT: When Dr. Nomland and I first saw this patient, the reticular arrangement of the lesion suggested that the condition might be one of the disorders of the blood vessels. We did a biopsy and made intradermal injections of tuberculin. The sections were positive in a dilution of 1:1,000, but negative in higher dilutions. There were no focal reactions in the lesion itself. The histology definitely fits in with that of syphilis, and we can interpret the history definitely as syphilis. The nodules absorb spontaneously, without ulcerating, and leave the areas of atrophy and pigmentation. I think that the diagnosis is late syphilis. The Wassermann reaction is negative.

DR. RUBEN NOMLAND: I think that the microscopic changes are characteristic of syphilis and that we can easily differentiate it from tuberculosis.

DR. O. S. ORMSBY: I think that we can get atrophy of this type without any preceding definitely nodular lesions.

GRANULOMA ANNULARE. Presented by DR. S. W. BECKER (by invitation).

A girl, aged 3½, had a lesion that was first noted at birth. At that time it consisted of a small "bead" between the second and third metacarpal bones on the right hand. It had extended distally as a series of beads and had spread rapidly in the past six months. There was no history of tuberculosis in the family.

Over the second and third metacarpals and extending over the second metacarpophalangeal joint was a polycyclic lesion, with an elevated, pinkish border, which was more marked distally.

Microscopic section from the advancing border showed thickened stratum corneum with slightly acanthotic and edematous epidermis. The vessels of the superficial dermis were involved in perivascular infiltration of round cells. Deeper down was more massive infiltration of round cells, fibroblasts and epithelioid cells. One multinucleated giant cell, not of the Langhans type, was seen, and there was one small area of simple necrosis.

DISCUSSION

DR. H. R. FOERSTER: I thought that this was a case of granuloma annulare. Lesions of this sort are known to occur in young children, but I cannot recall ever having heard of any that were present at birth, or that began so shortly afterward.

DR. C. W. FINNERUD: It may be worth mentioning that although the section is a poor one, apparently there is an area of central necrosis in it.

A CASE FOR DIAGNOSIS (LUPUS ERYTHEMATOSUS? FOLLICULITIS DECALVANS?). Presented by DR. S. W. BECKER (by invitation).

A woman, aged 42, said that she had had a "pimple" on the right frontoparietal region eight years before presentation. She scratched it and it became crusted and spread peripherally. Several methods of treatment had been used, some of them rather destructive, but no roentgen therapy. The lesion was spreading slightly.

Examination showed a thin, atrophic scar about 5 by 7.5 cm. on the right frontoparietal region. Loosely adherent scales were observed near, but not right at, the periphery. When these were elevated, a slightly oozing surface presented, with follicles still present. The periphery of the lesion was not particularly erythematous.

DISCUSSION

DR. L. M. WIEDER: I was inclined to regard the lesion as an old patch of lupus erythematosus. Very faint activity, but no definite scaling, was still present peripherally.

DR. C. J. WHITE: I venture the diagnosis of pseudopelade, although it is not a classic case.

DR. O. S. ORMSBY: This case brings up the ever recurring discussion. We often have difficulty in distinguishing between pseudopelade, lupus erythematosus, favus and folliculitis decalvans. The atrophy in pseudopelade is preceded by mild erythema only and can, therefore, be ruled out here by the history of early purulent crusted lesions. Lupus erythematosus may be excluded on the same grounds. The early history favors favus and folliculitis decalvans. The latter disorder is the most likely diagnosis.

DR. J. H. MITCHELL: My experience with pseudopelade has been that there is a large area in which there are numerous islands of alopecia. The little patch at the edge in this case rather suggested pseudopelade. The scarring is not the white, cigaret paper scarring one expects to find in lupus erythematosus. I am unable to come to a definite conclusion or diagnosis.

DR. S. W. BECKER: One element which has not been mentioned and which we considered is the question of the treatment the patient received. She insists that the treatment was very strong and produced some destruction. We thought that perhaps some arsenic plaster had been used, which would give her a lesion of this sort.

CARCINOMA (INTERMEDIARY TYPE). Presented by DR. S. W. BECKER (by invitation).

A woman, aged 73, said that an oozing ulcer had developed over the saddle of the nose, which persisted for many years and healed. Treatment included the use of the roentgen ray. Two years before presentation the septum at the vestibule became inflamed and sore but not ulcerated. Six months previous to presentation, following the removal of a vibrissa, facial erysipelas developed and she was ill for two weeks. She attributed the swelling of the septum to this infection.

A thin, atrophic scar could be seen over the bridge of the nose, with an erythematous, translucent, telangiectatic nodule on the right side, 0.5 by 0.75 cm. Extending from the bridge of the nose to the cheek were firm nodules, evidently attached to the bone. On the septum at the vestibule was a firm, cartilaginous swelling, occluding the left nostril and partially occluding the right. The right side of the bony septum was ulcerated and bleeding. A seborrheic verruca was present on the right upper lid.

A section was removed from the nodule on the bridge of the nose and at the vestibule. Both showed deeply infiltrating carcinoma of the intermediary type, extending in anastomosing strands and cords. No horny pearls and no cells of the basal type could be found. Connection of the tumor mass with the epithelium was found only in the nodule on the bridge.

DISCUSSION

DR. C. W. FINNERUD: I can say that I was much surprised at the histologic section. The proliferation, though largely of basal cell character, was apparently of the intermediary type.

DR. RUBEN NOMLAND: I think that the microscopic picture is that of an epithelioma of grade III or IV malignancy, according to Broder's classification.

DR. S. W. BECKER: The case excited considerable interest. When first seen in the otolaryngology division, she was thought to have chondroma or osteoma. We thought that the lesion on the bridge of the nose was carcinoma, but suspected that the process at the vestibule might be that of rhinoscleroma. The lesions at the vestibule are probably direct extensions from the carcinoma on the bridge of the nose which has been healed by roentgen therapy.

PARAPSORIASIS: PITYRIASIS LICHENOIDES CHRONICA. Presented by DR. RUBEN NOMLAND (by invitation).

A boy, aged 12, who was in good health, had a skin eruption of eight months' duration. He did not recall how the trouble began. There was no subjective symptom.

Physical examination revealed nothing abnormal except the eruption, which was generalized over the body, upper arms and thighs.

The eruption consisted of numerous lesions varying in size from 1 to 10 mm. in diameter, most of them being the size of a pea. The smaller lesions were red, slightly scaling papules, bearing some resemblance to the papules of lichen planus. The larger ones were finally scaling and slightly elevated, resembling somewhat the lesions of pityriasis rosea.

The Wassermann reaction had been repeatedly negative, and there was no evidence of syphilis.

DISCUSSION

DR. L. M. WIEDER: I agree with the diagnosis and think that the case is typical of that disorder.

Regular Meeting, Nov. 20, 1929

H. R. FOERSTER, M.D., *President, Presiding*

PEMPHIGUS (LIMITED TO THE MUCOUS MEMBRANES). Presented by DR. B. BARKER BEESON.

A woman, aged 53, had had recurring crops of "blisters" in the mouth for the past two years. There had been similar involvement of the conjunctiva of the left eye for about one year but no skin lesions at any time. The patient felt fairly well despite a loss of 50 pounds (22.7 Kg.) since the onset of this disorder. Numerous smears and cultures from the oral lesions, made by Dr. Pribram, had disclosed no definite etiologic factor.

Examination revealed the remains of numerous blebs over the mucosa of the cheeks, and the hard and soft palate. A tense bleb, the size of a navy bean, was present on the right side of the hard palate. There was a pterygium-like process extending up toward the left pupil from the neighborhood of the inner canthus. Near the outer canthus of the same eye there was a well marked synechia. Close

to the outer side of the left pupil was a flaccid bulla which was somewhat larger than the one in the mouth. There was a complete absence of any skin lesions.

DISCUSSION

DR. LIEBERTHAL: In this case I should suggest not the Davis treatment but the vigorous use of the Asiatic pill. A case was demonstrated before this Society, over six years ago, with lesions of the mouth and some on one shoulder in which we all agreed on the diagnosis of pemphigus. I had charge of that case and pushed the treatment with the Asiatic pill. The patient improved gradually, so that in a few months she was in a good enough condition to take a trip to Palestine. It is now about six years since that treatment was used and she has remained well.

DR. J. H. MITCHELL: Was any organism found in the present case?

DR. E. A. OLIVER: I have always considered the prognosis very grave when the lesions begin on the mucous membranes. In the average case, when the mucous membranes become involved, the end is not far away.

DR. B. BARKER BEESON: I have not found any organisms.

KELOID (IN A WHITE INFANT SECONDARY TO INJURY SUSTAINED AT BIRTH). Presented by DR. CLARK W. FINNERUD.

A Polish infant, aged 4 months, had a horizontally disposed linear lesion of the base of the chin about 4 by 0.4 cm. The mother said that she knew nothing concerning the history of the lesion, and that it was present when she first saw the infant. The infant was delivered by instruments and was not seen by the mother until it was 16 days old. She then noted that the chin was bandaged. As far as she could remember, she did not see the infant's unbandaged chin until she left the hospital, three weeks after delivery. The lesion had been growing ever since it was first seen by the mother.

DISCUSSION

DR. J. H. MITCHELL: Has every effort been made to exclude the presence of a foreign body?

DR. CLARK W. FINNERUD: No effort has been made at all. I saw the child only a short time ago and suggested that she be brought here today. The mother could give no satisfactory history as she did not see the infant until it was 16 days of age.

DR. J. H. MITCHELL: Last year I saw a young girl who had had an operation for a harelip. A keloid process was present and I treated it with roentgen therapy, but now and then it would break down. Finally it was discovered that a foreign body had been left at operation, and after its removal the lesion healed.

CARCINOMA OF THE PENIS. Presented by DR. E. A. OLIVER.

A man, aged 33, had had an adherent prepuce all his life; in August, 1928, he was circumcised. Immediately after the operation, hard, warty elevations appeared on the head of the penis, completely encircling it, and had persisted despite cauterization.

When first seen by Dr. Oliver, the head of the penis was the site of a rough, dry, densely infiltrated mass of tissue. There were no subjective symptoms. Biopsy was refused at that time, and he was given a strong salicylic acid ointment to apply locally. This failed to make any impression on the growth. Biopsy was done on October 29 by Dr. Nomland.

DISCUSSION

DR. J. H. MITCHELL: I was not quite sure of the diagnosis. A marked acanthosis and also some pearls were present. The resistance of penile warts to therapy does not surprise me for it is often amazing. I found an enlarged gland

on each side in the inguinal region high up which would indicate trouble if it really is a squamous cell epithelioma.

DR. CLARK W. FINNERUD: Histologically, I took the lesion to be an early squamous cell carcinoma.

DR. L. M. WIEDER: I agree with Dr. Finnerud's point of view. Microscopically, I think that the observations are in favor of a verrucous type of lesion, definitely precarcinomatous. The adenitis is bilateral and moderately soft, and the glands are fairly similar in size. I think that the glandular condition may be a toxic or an irritative lymphadenitis. It would be interesting to have a gland for microscopic study.

DR. E. A. OLIVER: The question of therapy comes up. The patient has had an adherent prepuce with pinpoint meatus all his life, and this condition developed following circumcision a year ago. It is evidently not very malignant. The family physician cauterized the growth several times, without any effect. I suggested a biopsy when the patient was first seen, but he would not permit it. He was given four one-fourth skin unit treatments with the roentgen ray and then salicylic acid ointment, but there was no effect on the lesion. Finally we persuaded him to permit a biopsy, and Dr. Nomland did this one. While the section is suggestive of malignancy, I believe that it is precancerous and can be treated safely with radium.

DR. RUBEN NOMLAND: After studying the section, I think that it will fall in the classification of grade I carcinoma, according to Broders. I have seen one case before. The lesions metastasize rather slowly and are relatively benign.

DR. H. R. FOERSTER: If the condition is carcinoma, there is metastasis to the large glands. In view of the grave prognosis in such an instance, the suggestion that a section be removed for histologic study should be followed.

ONYCHOMYCOSIS (MONILIA) AND CHRONIC SUPPURATIVE PARONYCHIA. Presented by DR. CLEVELAND WHITE.

Mrs. A. C., an American housewife, aged 55, had had three "sore," swollen finger tips for six and one-half years. The pain had been especially marked for three years.

Examination showed the nails on the involved fingers to be roughened and corrugated with some powdery disintegration. Pressure usually produced droplets of pus from the nail beds. Cultures taken from the involved nails yielded *Monilia* on several plantings. Staphylococci grew sparingly from the minute amounts of pus expressed, but it was impossible to obtain sufficient growth in the mediums to produce an autogenous vaccine.

As the pyogenic factor seemed to be the most important from the subjective point of view, it was decided to give a mixed saphyloccic vaccine. After four injections (subcutaneously) at weekly intervals, there was no longer any soreness in the involved fingers for the first time in three years. Eight more injections were given; the suppuration stopped completely and remained so for four months. The patient had a moderate systemic reaction following each injection which consisted of headache and malaise for a varying number of hours. She said that she had used soap and water during the past four months.

The patient was presented to show the results of treatment for the stubborn suppurative paronychia.

DISCUSSION

DR. J. H. MITCHELL: I am interested in the etiology and treatment of such cases of chronic paronychia. I do not remember whether or not radiotherapy had been given in extensive doses. In these cases I have found the method of treatment I learned from Dr. Ormsby, consisting of the use of chrysarobin in chloroform, applied with an orange wood stick (from 5 to 10 per cent) twice a day, to be very effective.

EROSIO INTERDIGITALIS MYCOTICA (BILATERAL). Presented by DR. CLEVELAND WHITE.

Mrs. M. M., an American housewife, aged 59, had had interdigital erosions on each hand in the third interspace for three years which were accompanied by considerable burning, especially after the use of soap and water. She said that she had had a previous attack about thirty years before presentation, which cleared up in four months without any particular treatment. She had done ordinary housework at her home, but very little laundry.

Extemporaneous potassium hydrate preparations revealed rather large branching hyphae similar to fungi often found between the toes in ordinary "ringworm." Cultures were negative. Four one-fourth unit treatments of Grenz rays at weekly intervals were administered to one area (with the help of Dr. Dorne), while the other one was used as a control. No improvement was detected from the use of the Grenz ray in this dosage; in fact, the patient thought that it aggravated the treated area.

The patient was presented because of the finding of ringworm fungi in lesions which are usually considered of yeast or *Monilia* etiology and because of the experience with the Grenz ray.

DISCUSSION

DR. J. H. MITCHELL: I was interested to hear that only mycelial threads were found in a lesion of this type, as I have never seem them without the spores. I have seen a number of pseudo-erosios due to *pyogenes* and all have cleared up quickly, in contradistinction to the true erosio of yeast origin.

DR. CLARK W. FINNERUD: Castellani and others have reported finding *Epidermophyton* and similar organisms in lesions which clinically are those of erosio interdigitalis, with or without the organisms commonly found.

DR. CLEVELAND WHITE: I wish to know whether Dr. Mitchell would call this a true case of erosio?

DR. J. H. MITCHELL: Clinically, the condition is not quite what I expect to find, but I suppose that treatment has modified the lesion a great deal. Later on the lesions may become greatly thickened with continued applications of all sorts.

DR. CLEVELAND WHITE: According to her history, the patient has had considerable treatment. I took scrapings and thought that I would find some *Blastomyces*. I took a large scraping of the soft material and was quite surprised to find the undoubted branching hyphae present. My experience is that some cases are caused by the yeast, some by *Monilia* and some by our ordinary "ringworm" fungi. Some cases are probably due to bacteria and not to a fungus.

EROSIO INTERDIGITALIS. Presented by DR. J. H. MITCHELL.

A Jewish woman, aged 50, had been treated with saturated solution of gentian violet since August 1, but the cultures remained strongly positive.

Two other patients had been receiving continuous treatment with saturated solutions of gentian violet for several months, but the conditions remained active and gave positive cultures of the yeast organism. (Photographs and cultures were demonstrated.)

DISCUSSION

DR. H. M. HEDGE: I should like to know whether a fixing solution was used after the gentian violet. About two months ago I treated a patient in whom the yeast organism was found, both by culture and in smears. I used gentian violet alone for about a month, with very poor results. Then I used iodine after the administration of the gentian violet and the results were good. The lesions cleared up entirely in about three weeks.

DR. J. H. MITCHELL: No fixing solution was used. I have been interested in the effect of gentian violet since Stokes showed his case in Philadelphia. Two of my patients were treated with 5 per cent solution with no benefit. Then to

determine the value of a saturated solution I treated three patients intensively. The conditions have improved in appearance but there has been no elimination of the organism. Prior to the administration of the gentian violet all of the patients received application of strong tincture of iodine, in addition to all other methods, often without effect.

NOTE.—Since this case was presented, three patients have been treated daily for more than two months each with the combined gentian violet and applications of tincture of iodine. Nevertheless, the lesions persist and the cultures for *Monilia* continue to be positive. Spores taken from the cultures grow almost as readily after saturation with gentian violet as the unstained spores.

NEUROTIC ULCER. Presented by DR. A. W. STILLIANS.

An American housewife, aged 53, had arthritis in 1926, which lasted for more than two years. This was cleared up on Dr. Elliott's service in Wesley Hospital, but during her stay there she developed multiple nodules on the legs which came and went for several months. Since leaving the hospital, one of these had appeared on the right ankle, was massaged and developed a black crust. This lesion did not heal, but enlarged. On entrance to the Northwestern University Clinic, the patient presented a foul ulcer 10 by 7.5 cm., with a black crust over the advancing polycyclic border. Beyond this was a violaceous zone, about 1 cm. in width, and still further out a wider ill defined pink zone. Below the ulcer was a scar, also with a polycyclic configuration. During her stay in Wesley Hospital, repeated blood cultures had been negative. All efforts to get cultures from the ulcer and puncture of the advancing borders were futile. Blood counts were normal. The Wassermann and Kahn reactions were negative. Since the leg had been dressed with zinc paste and an occlusive dressing had been applied over the ulcer, marked improvement had occurred.

DISCUSSION

DR. L. M. WIEDER: I agree with the diagnosis. I do not know whether the patient produces the lesions intentionally, but I think that she is the type who might interfere with treatment by picking. She is very tense and nervous, and while I feel that the case is one of neurotic excoriation it possibly is not one of intentional production.

DR. A. W. STILLIANS: That was my idea in naming the case, I do not think that the lesion was produced intentionally, but that it is the result of the patient's attempts at treatment with an exercising machine.

COCCIDIOIDAL GRANULOMA. Presented by DR. E. P. ZEISLER.

A man was first presented at the special meeting for Professor Jadassohn in June, 1929, at which time the disease was very active. Since that time he had received two courses of treatment with antimony and potassium tartrate to the point of tolerance. Between these courses he had received colloidal copper intramuscularly every five days. The lesions on the face showed a striking improvement and those on the back had flattened out, leaving chiefly atrophic scars.

Six weeks before presentation, a biopsy from an atrophic lesion on the back still showed *Coccidioides imitis*. (A slide was presented.)

DISCUSSION

DR. J. H. MITCHELL: I was interested to see this patient, for I did not have an opportunity to see him at the previous meeting. It is of interest to compare this case with the one shown at San Francisco. The lesions in the latter case were almost identical with those of the patient presented.

DR. L. M. WIEDER: I think that the therapy used in this case should be published. When the patient was shown before, the outlook seemed to be very pessimistic, and I am greatly interested to see the improvement, even though the organism can still be demonstrated in the lesions.

DR. CLARK W. FINNERUD: During the last year or so, colloidal copper has been used extensively in these cases. We saw some cases in San Francisco and some in Portland in which the patients had been treated successfully.

DR. E. A. OLIVER: Several of the physicians at the meeting in San Francisco expressed some doubt about the benefits to be derived from the use of colloidal copper, but this patient states definitely that the colloidal copper has helped him more than the antimony and potassium tartrate.

NOTE.—Since this case was shown, the patient's condition has become much worse and he no longer responds to the copper therapy.

A CASE FOR DIAGNOSIS (PSORIASIS?). Presented by DR. A. W. STILLIANS.

A stout American woman, a caretaker, aged 53, began to have an eruption on the palms and soles in 1927, which became worse in the spring of 1929. Roentgen therapy at Grant Hospital cleared up the eruption during the summer, but it recurred and became worse, accompanied by much burning and itching of the palms and soles, with pain from fissures. The lesions began as ill defined, dusky red maculopapules, which soon became scaly, forming a collaret, enlarged and joined others to form polycyclic patches.

The palms and soles were hyperkeratotic and tended to fissure. Scales were abundant between the toes. Many efforts to find fungi had failed. Biopsy showed only a mild dermatitis. The blood count gave normal results.

DISCUSSION

DR. F. E. SENEAR: The condition was modified by treatment, and I should hesitate to express a definite opinion. From a distance rather than on close examination, the eruption impressed me as psoriasis with extensive involvement of the palms and soles.

DR. J. H. MITCHELL: The intense itching suggested the possibility of mycosis fungoides.

DR. CLEVELAND WHITE: I saw this patient before she had received so much treatment and at that time I felt that if I were forced to make a diagnosis I should call it psoriasis. We have examined the scales thoroughly for fungi. At Northwestern University there is a senior student who has found fungi in thirty-nine of forty cases, showing what a person with limited experience can do. I think that if fungi were present we would stand a good chance of finding them.

DR. A. W. STILLIANS: We thought of psoriasis, but the case was so atypical that we did not dare make that diagnosis. The prompt response to roentgen therapy is in favor of that diagnosis.

POIKILODERMIE RÉTICULÉE PIGMENTAIRE DU VISAGE ET DU COU (CIVATTE). Presented by DR. RUBEN NOMLAND (by invitation).

A fairly well nourished Mexican, aged 58, had had a pigmentary disorder for five or six years. Because of language difficulties an accurate history was unobtainable. The condition apparently began on the face and then appeared on the arms. There were no subjective sensations, and his general health was unimpaired.

General physical examination showed nothing abnormal except a mild hypotension; the blood pressure was 112 systolic and 68 diastolic. The condition was present on the face, neck, flexor aspects of the upper arms, forearms and wrists. It consisted of a brown, reticulated pigmentation with islets of normal-appearing skin in the meshes of the pigmented reticulum. The size of the normal areas varied; in the antecubital regions the diameter was from 1 to 2 cm., on the face and neck it was about 0.5 cm. and on the wrists the pigmentation was almost solid. The pigmentation followed a pattern similar to the pattern of

cyanosis in cutis marmorata. There was no vascular element, but there was slight macroscopic atrophy on the wrists which showed as fine wrinkling.

A biopsy from a lesion on the forearm showed rather marked atrophy of the epidermis. In some places there were only four or five rows of cells. There was vacuolization of some of the cells of the basal layer. Beneath the epidermis there was a moderate, diffuse and rather marked perivascular infiltrate of the round and connective tissue cells. Interspersed in the infiltrate were numerous pigment-bearing (melanin) chromatophores. There was slight homogeneization of the connective tissue. The elastic tissue had been destroyed in the upper cutis. The adnexia, the deeper blood vessels and the dermis at the edges of the section were normal.

DISCUSSION

DR. M. S. WIEN: This case resembles one shown by Dr. Senear and myself at the October, 1928, meeting of the Society (ARCH. DERMAT. & SYPH. **19**:504 [March] 1929). Our case was in a boy, aged 15, who presented mottled areas of dull red to light brown pigmentation about both ears, down the neck and across the forehead, containing scattered foci of superficial atrophy. The histologic sections revealed inflammatory changes in the epidermis and adjacent cutis with atrophy of the skin and disappearance of the elastic tissue. Numerous chromatophores were present. The case was seen shortly after the appearance of Little's article (*Brit. J. Dermat.* **40**:231 [June] 1928) and suggested the diagnosis of poikiloderma (Civatte). The lesions in the case presented by us seemed to correspond in location and type to those in the cases described by Civatte and Little. Histologically, the observations in our sections corresponded to a considerable degree with the description of the sections in Civatte's cases. At the time of presentation of our case the diagnosis of erythematous lupus occupied most of the discussion although it was admitted that histologically it did not correspond to this clinical diagnosis. I have seen the boy since and there has been slight improvement in his condition. He has been given suprarenal extract by mouth, as recommended by Little. One linear patch persists on the side of the neck. I have tried to get a biopsy from this area but the boy's mother objects. Our case had more of a brownish hue against the slate color in the present one.

DR. CLARK W. FINNERUD: I think that there was enough deep pigment in the section to account for the color. I saw no evidence of silver deposit. This can be determined definitely with the ordinary stains. I could not be sure about the atrophy of this case. On looking at the skin very closely, I could see discrete polygonal papules in some places and in others a lichenified appearance. I wonder if the case is not related in some way to the lichen planus group.

DR. E. A. OLIVER: I hold the same opinion as Dr. Finnerud.

DR. RUBEN NOMLAND: As far as I can determine, this case corresponds well to the poikiloderma of Civatte, which is very different from that described by Jacobi. As far as the pigmentation is concerned, it seems to be high up, just beneath the epidermis. I have thought of the possibility of silver but have not been able to find any. The patient was sent in with the diagnosis of argyria because he had worked for a number of years in the silver mines in Mexico.

LICHEN PLANUS. Presented by DR. H. M. HEDGE.

R. L. S., a white man, a dentist, aged 46, noted that his fingernails were pitting, only three fingers being exempt, the left ring finger, the right thumb and the right small finger. Shortly after the onset of the irregularity in the finger-nails a clearcut case of lichen planus developed, which had spread over the sternal region and the wrists, a few lesions presenting on the back.

The case was presented with the hope that discussion might be provoked as to the possible association between lichen planus and the condition of nails. Scrapings from the nails failed to show any fungus in smears or cultures. There was no sign of psoriasis. The Wassermann reaction was negative.

DISCUSSION

DR. J. H. MITCHELL: My impression was that the patient presented a condition of the nails probably caused by the roentgen-rays, co-existing with the other complaint.

DR. M. F. DOTY: My impression is that there are two conditions. I think that the condition of the nails is due to an infection from procaine hydrochloride, which the patient uses in connection with his profession. The lesions on the body look like lichen planus, and I agree with the diagnosis.

DR. CLARK W. FINNERUD: I saw this patient with Dr. Ormsby in February, 1927, at which time only three nails were involved. He gave a history of having operated a roentgen ray machine for eight years, of having to do with the development of films and of being exposed to compound solution of cresol, procaine hydrochloride and other irritants. We could not be sure about it but thought that, from the history and the appearance of the nails, the changes were probably due to the roentgen rays; we could not account for the fact that only a few of the nails were involved. Scrapings were negative for fungi.

DR. H. M. HEDGE: I think that there are two conditions present and that the condition of the nails has no relationship to the lichen planus, but I thought that it might be interesting to provoke some discussion in regard to the possibility of some connection between the two.

ERYTHEMA MULTIFORME (LESIONS LIMITED TO THE MOUTH AND PENIS). Presented by DR. RUBEN NOMLAND (by invitation).

This was the second attack of erythema multiforme that the patient had had within three months. The first one was similar in all respects to the present one. The condition began about ten days prior to presentation with the formation of deep-seated, painful blisters in the mouth and on the penis, which soon ruptured, leaving crusted areas that were moderately painful.

There was denudation of the epidermis of almost the entire hard palate, with a few smaller lesions on the upper lip and the tongue. There was a large denuded area on the glans penis, occupying about one fourth of its surface. On the back were two erythematous maculopapules, the size of a dime.

DISCUSSION

DR. J. H. MITCHELL: I was interested in seeing this manifestation of multiform erythema.

DR. L. M. WIEDER: I think that a careful search should be made for a focus of infection. Last year we saw a similar case with infected tonsils, which were removed, and this year the patient returned with another attack of erythema multiforme and acute sinusitis, which we felt was associated with the subsequent attack.

DR. F. E. SENEAR: I wonder whether it has been ruled out definitely that the condition is not due to phenolphthalein. This was suggested to me, for while I have had cases limited to the buccal mucous membrane occasionally, I do not recall any in which both the mouth and the penis were involved, and that association is common in eruptions caused by phenolphthalein. I think that we should look into the history very carefully before accepting a diagnosis of erythema multiforme.

DR. RUBEN NOMLAND: When the patient recovers from this attack, we shall test him with phenolphthalein and see what happens.

A CASE FOR DIAGNOSIS (PRURIGO MITIS IN A NEGRO). Presented by DR. RUBEN NOMLAND (by invitation).

A husky negro, aged 39, had had an itching disorder of the skin for about two years. It began as a pruritus on the thighs, which later spread to the arms

and forearms. About a year before presentation the itching appeared on the body. The patient thought that the lesions appeared only after prolonged rubbing and scratching incident to the pruritus. He had been under observation for six months, during which time he had become steadily worse. None of the usual measures seemed to control the itching.

The lesions presented were almost universal with the exception of the face and hands. The eruption was most marked on the arms, thighs and body. It consisted of lichenified patches made up of small papules. At the borders of the patches the papules were fairly discrete.

A biopsy was made from a lesion on the body. The section was cut on the bias but showed slight, spotty parakeratosis and moderate acanthosis. All of the vessels of the mid and upper cutis had a slight round cell infiltrate about them. There were no plasma or mast cells.

A Case for Diagnosis (Prurigo Mitis in a Negro?). Dermatosis Papulosa Nigra. Presented by Dr. Ruben Nomland.

A well preserved negro, aged 79, had an itching disease of the skin of four years' duration. It began on the forearms and spread to the legs, thighs and body. In the beginning no lesions were present. The itching was intense and paroxysmal, sometimes disappearing almost completely. The periods of quiescence lasted only a few days. At such times the "bumps" on his skin were scarcely noticeable.

The condition that he presented on the face had been present ever since he could remember; he said that other members of the family had similar pigmented lesions on the face.

Inspection showed a generalized eruption which involved most of the body except the face, palms and soles. It consisted of lichenoid, round, slightly pigmented papules which were thickly studded on the forearms, arms, thighs and body. The lesions were discrete.

The lesions on the face consisted of soft black papules, varying in size from that of a pinhead to that of a pea. They were quite numerous, totaling about 100.

DISCUSSION

Dr. F. E. Senear: About 1917, I think, Dr. Stillians and Dr. Harris showed several colored patients at different meetings with much the same picture. There was much discussion, but I think that the consensus then was that the colored skin is prone to develop this type of disorder. At the University we have had several of these cases. We see them only in the colored race and cannot classify them. Often the lesions are follicular, and in other cases there is no relation to the follicles. While we know that the colored skin is resistant to the industrial irritants, it seems particularly liable to this type of reaction.

Dr. E. A. Oliver: I agree with Dr. Senear. We frequently encounter these cases at the Cook County Hospital and are unable to place them in any definite class. We have a colored women in bed there now who has a generalized lichenoid eruption, and we have been unable to make a diagnosis.

Dr. Cleveland White: In my work with the Chicago Health Department we see a good many of these cases and have been unable to diagnose them satisfactorily. I am glad to hear Dr. Senear and Dr. Oliver say they have had the same experience.

Dr. M. F. Doty: In Detroit we see many of these cases, and my experience is that they are more common among the older patients than among the younger ones.

Dr. H. R. Foerster: I have observed these lichenoid eruptions in negroes, in whom they appear frequently, and have speculated about them, but have no explanation to offer.

DR. J. H. MITCHELL: Dr. Nomland and I saw a colored child last summer with what we agreed was the dermatitis papulosa nigra of Michael. We found that four or five members of her immediate family and some of her ancestors had had similar lesions. They were not nearly as pronounced as these lesions, but they fitted in more nearly with what Michael described than these lesions do.

DR. RUBEN NOMLAND: I presented these two patients because of various conversations I have had with the Rush faculty and others about these itching, papular eruptions in colored persons. I have thought that perhaps someone would give them a name. I have seen only one case of prurigo mitis, but from the textbook description it seemed as though it might be one transferred over to the black race. We have seen quite a number of cases of dermatitis papulosa nigra; most of them are familial and are relatively common in the colored race. We made a biopsy in one of the cases shown and there was nothing in it that resembled the pathologic changes of lichen planus. The pathologic change more nearly represents those given in the textbooks as occurring in prurigo mitis.

A CASE FOR DIAGNOSIS (ACNE SCROFULOSORUM?). Presented by DR. S. W. BECKER (by invitation).

A woman, aged 44, presented lesions on the dependent portions of the breasts, which had been present for ten years. They began deeply, approached the surface and involuted, with or without discharging a hemorrhagic purulent material. They were erythematous at first, becoming bluish in the later stages and persisting for weeks. The condition had caused her only slight discomfort or concern.

Examination revealed a healthy woman with lesions on the dependent portions of the breasts in various stages of evolution. The two lesions on the right breast were erythematous nodules 0.5 cm. in diameter, and were slightly elevated. Those on the left breast were bluish-red, infiltrated plaques, 0.5 cm. in diameter, which could be lifted up with the skin but seemed to be deep in the dermis. No definite scars could be seen.

The Kolmer and Kahn tests of the blood gave negative results, as did the urinalysis.

Microscopic examination showed generalized, mild, perivascular infiltration, largely with round cells. About a follicle was an infiltrate consisting of a few epithelioid cells, giant cells and round cells. The collagen fibers were disintegrated and appeared as round elements, with or without a nucleus, some of which stained red with van Gieson's method and some of which took the yellow stain. A short distance from the follicle was a necrotic area containing in addition considerable fluid and polymorphonuclear leukocytes. The Gram stain showed many gram-positive cocci in the necrotic region and a very few in the other inflammatory tissue. No acid-fast bacilli could be found.

DISCUSSION

DR. L. M. WIEDER: I examined the section but could make no diagnosis from that or the clinical picture. I think that it may possibly be a low grade staphylococcic infection, or a very low grade streptococcus, somewhat analogous clinically to the lesions of acne varioliformis of the face.

DR. M. F. DOTY: I thought that it was a low grade infection, possibly caused by staphylococcus or streptococcus.

DR. J. H. MITCHELL: I reached no conclusion about this case, but the lesions on the left breast suggested the possibility of an infected sebaceous cyst.

DR. CLEVELAND WHITE: We have a patient under observation who has a condition almost identical with the one presented. I think that it is a low grade acneform eruption, which might possibly come under acne scrofulosorum.

DR. S. W. BECKER: Before we found cocci in the section, we thought that the condition might be tuberculosis or sarcoid. We have not been able to make a definite diagnosis, nor to find a description of any pyogenic infection that corresponds with the picture presented.

Regular Meeting, Dec. 18, 1929

H. R. FOERSTER, M.D., *President, Presiding*

LUPUS ERYTHEMATOSUS TELANGIECTODES. Presented by DR. O. S. ORMSBY.

A man, aged 53, was presented to show the effect of treatment with gold sodium thiosulphate on lupus erythematosus telangiectodes. He was first seen on June 25, 1929, at which time the disorder was of three months' duration. He said that it began as a pimple on the nose and spread from this situation over the face, ears and neck.

When first examined, both cheeks were occupied by a symmetrical eruption which consisted of pale red, moderately elevated and infiltrated plaques, about the size of a palm, on either cheek, at the margins of which were large numbers of telangiectatic vessels. The nose, chin and neck were occupied by lesions, the size of a pea, of a similar nature. The mucous membranes of both lips presented a moderate degree of dermatitis, in which there were grayish-white, shiny lesions, the size of a pea. The center of the tongue presented an oval, atrophic lesion with a depressed center and a raised grayish-white margin. His appearance at that time was shown by a photograph.

From the latter part of June to October 16, seventeen injections of gold sodium thiosulphate were given, with splendid results. All of the dilated vessels had disappeared, the inflammatory reaction had entirely subsided and only the atrophic relics on the cheeks and some other areas remained.

DISCUSSION

DR. U. J. WILE: I think that this case shows an excellent therapeutic result. I was interested to learn that Dr. Ormsby did not give over 50 mg. of a gold compound at any one dose.

DR. P. A. O'LEARY: I was pleased to learn of the therapeutic effect in this case, particularly because therapeutic results of this degree following therapy with a gold compound are becoming less common. We continue to see an increasing number of relapses in lupus erythematosus after this therapy.

DR. A. W. STILLIANS: I am glad to see the good effects in a case with such marked telangiectasis, and think them very encouraging.

DR. O. S. ORMSBY: The striking characteristic in this case was the enormous number of dilated blood vessels. Telangiectatic lupus erythematosus is comparatively rare. Most of the recorded cases have been mild. It is somewhat difficult to place the present case exactly; that is, to say whether it is the telangiectatic type of the disorder or whether the telangiectasia is a complication in an ordinary case. As the symptoms of the disease cleared up under treatment with a gold compound the blood vessels also disappeared. This seems to show that they were involved by a common process. My experience agrees with that of Dr. O'Leary regarding relapses in this disorder following the use of the gold preparations. Notwithstanding, the treatment is still very efficient, even though it has not accomplished all that was expected. My experience has been that the response to treatment in relapses is not so good as that in primary cases.

KERATOSIS PUNCTATA (?). Presented by DR. CLEVELAND WHITE.

Mrs. S., aged 52, an American housewife, had had thickening of the palms and soles for fifteen years. She had recently consulted a physician because of symptoms which proved to be those of diabetes mellitus, and incidentally sought advice as to the palms and soles. The diabetes had been easily controlled by diet and insulin.

Inspection of the palms and soles revealed a rather heavy thickening with numerous small crateriform pits, which were discrete on the palms but more confluent on the soles. The general examination showed nothing of importance.

No fungi could be found. There was no history of arsenical medication previous to the onset of the thickening and the pitting, and no record of any member of the family with a similar eruption.

It was not considered expedient to take a biopsy in such distal areas in view of the patient's diabetic tendency.

DISCUSSION

DR. U. J. WILE: I think that this patient has had arsenic and that the keratoses on both the palms and the soles are sufficiently characteristic, together with the localized hyperkeratosis and general thickening, to suggest a diagnosis of arsenical keratosis even in the absence of a history of arsenic therapy.

DR. O. S. ORMSBY: Punctate keratoderma is rare. Only a few cases have been recorded and in these the lesions were small and discrete and did not fuse to form plaques, such as the one shown by the patient presented. I have seen a number of patients with tylosis, in the plaques of which pits occurred, such as described by Dr. Wile. This case is undoubtedly a punctate keratosis, but it is not of the nevoid type, which was described originally by Galloway and subsequently by Sweitzer in this country.

DR. A. W. STILLIANS: The thing that impressed me was the pitting, particularly that on the arm. I wonder if we could remove some of the horny material and examine it for arsenic.

DR. CLEVELAND WHITE: I had not closed my mind absolutely to the diagnosis of keratosis punctata. I have never seen a case, but I thought that this was much like the case described by Sweitzer, and pictured in Sutton's textbook. The patient says that she has had no medicine containing arsenic, but we know that there are other various sources. I was afraid to attempt a biopsy on account of her diabetic condition. Horny material and hair will be taken for arsenic determination, at the suggestion of Dr. Stillians.

A CASE FOR DIAGNOSIS (LEUKEMIA CUTIS). Presented by DR. F. E. SENEAR and DR. M. S. WIEN.

H. I., a Jew, aged 35, first noted an eruption on the trunk seven months before presentation, which began as a group of reddish spots in the skin, without elevation. These spots gradually increased in size, number and intensity, becoming elevated, with the greatest number on the back and the most intense involvement along the vertebral column. The condition had remained stationary for the past five months. Mild itching was present occasionally. There had been no medication. The general health was good except for pain and circulatory disturbances in the right leg, the condition being diagnosed as thrombo-angiitis obliterans by the neurologic department.

The patient presented a profuse eruption of papules, varying in size from that of a pinhead to that of a split pea, on the chest, abdomen and back with very close aggregation over the spine and extension down the axillary line of the trunk to the upper part of the thigh and the groin. The lesions were elevated, dull red to brownish papules, with shining, rounded or flat tops. They were infiltrated, and when pressure was applied the red disappeared, to be replaced by a pale brown, waxy papule. There was no scaling. Some of the lesions were adjacent to small, white, atrophic scars, while scars were also noted in other regions independent of the active lesions.

The Kahn test gave negative results; the basal metabolic rate was plus 16 and minus 5, respectively. Chemical analysis of the blood showed: blood sugar, 92; nonprotein nitrogen, 34; cholesterol, 135, and icterus index, 6.6. Urinalysis gave negative results. The blood revealed: 95 per cent hemoglobin, 5,020,000 red cells, 7,200 white cells, 54 per cent polymorphonuclears, 5 per cent large mononuclears, 33 per cent lymphocytes and 8 per cent eosinophils. Neurologic and general medical examination gave negative results, except for the circulatory disturbance of the right leg.

DISCUSSION

DR. U. J. WILE: I think that the diagnosis in this case does not depend on the clinical appearance of the lesions. The lesions suggest a lichenoid eruption. They are rounded and rather glistening and have the yellowish tint of xanthoma, but under the microscope they were definitely made up of a group of closely packed, round, embryonal lymphocytic elements, which picture is entirely consistent with that of a lymphoblastic condition. On examination, I found that the patient had a large spleen and that the superficial lymph glands were much enlarged. I have no hesitation in saying that this is a case of leukemia cutis.

DR. CLARK W. FINNERUD: I became more or less convinced, after examining the patient with Dr. Wile and getting his impression about it, that although I have never known lesions of this type to be the "specific" lesions of leukemia, they must be such in this instance, rather than lesions of "nonspecific" type. After palpating the lesions, which are rather soft, I expected to find a granuloma histologically, possibly simulating the picture of miliary lupus. I was much surprised to find the histologic picture entirely in accord with Dr. Wile's clinical diagnosis.

DR. O. S. ORMSBY: The chief interest in this case lies in the type of lesion presented. I agree with the diagnosis presented by Dr. Wile. There are a number of cases now on record of leukemia with nodular lesions in the skin. It is interesting in this case that clinically the lesion is a papule, while pathologically it is a nodule. It is interesting to see a true leukemia associated with what appear clinically to be nonspecific lesions but which histologically have the specific architecture of leukemia.

DR. U. J. WILE: Because the internists passed this case up as negative, when the patient has a spleen that a medical student could feel and enlarged lymph glands, I wonder whether it would not be a good plan for a dermatologist to make a blood count. I think that in the purely aleukemic types of leukemia it would be rare to find a disseminated leukemia cutis of this kind. During the last few months, this patient must have had a blood picture analogous to that seen at the present time in the skin. I wonder whether on further examination we might not find a little more change in the lymphocytic index. Is not this type of cutaneous eruption more common in myeloid than in lymphatic leukemia?

DR. E. P. ZEISLER: I have in mind a case of splenomyelogenous leukemia in which the cutaneous nodules developed following splenectomy. They occurred principally on the shins, with a few along the scar of the splenectomy and on the face. The nodules were soft and brownish, varying in size from that of a pea to that of a bean, and resembling those in the case presented. The patient died about six months after the operation.

DR. F. E. SENEAR: We did not have the microscopic picture until today and without that I think we felt as most of the members did. We did not even consider the possibility of leukemia cutis. The lichenoid appearance struck us, but after considering the case we did not think that it was lichen planus. The lesions on the body resemble most those of xanthoma diabeticorum with the yellowish tops, and it was that investigation that led us to the study of the cholesterin. We could find nothing in that direction. I am grateful for the discussion and particularly for the demonstration of the enlarged spleen and other observations that had not been found. We shall repeat the blood tests.

A CASE FOR DIAGNOSIS (ERYTHEMA INDURATUM?). Presented by DR. F. E. SENEAR and DR. M. S. WIEN.

R. S., a housewife, born in England, aged 29, had always been in perfect health up to three years prior to presentation, at which time she developed an ulcerative colitis for which a colostomy was done two years before presentation. In May, 1929, she first noted a small lump, the size of a dime, below the right knee, which was painful but disappeared spontaneously during the next two months. Similar

lesions recurred in various locations on the anterior surface of the leg, to which she applied hot dressings. Some of the lesions ulcerated and gave a clear discharge. There was always a moderate associated redness of the leg. Three months before presentation a similar involvement was noted on the left leg. During the past six to seven weeks, the skin had appeared smooth and shiny.

The skin over both lower portions of the legs, with a greater involvement of the right, presented a smooth, somewhat glazed appearance with a rusty brown sheen. The skin in the involved areas was somewhat fixed to the underlying tissue, and when first seen there was pain on palpation over the affected areas along the crest of the tibia. Healing ulcers, which first appeared on Nov. 16, 1929, were noted over the left ankle. Roentgenologic examination of the long bones of the legs was negative.

The Kahn test gave negative results. Examination of the chest revealed nothing of importance. Proctoscopic examination revealed an acute ulcerative colitis, probably nontuberculous, with blood, pus and mucous in the stools. The bowel was friable and constricted throughout.

DISCUSSION

DR. P. A. O'LEARY: This patient shows erythema ab igne, from the local application of heat and a superficial phlebitis and arteritis. The doughy edema, as noted in the left leg, is consistent with involvement of the superficial vessels. The infiltration and sheen suggest the possibility of scleroderma, but I believe that it is not scleroderma in the ordinary sense of the term, but rather a secondary process to the vascular disease. The ulceration above the right ankle would readily fit in with this conception.

DR. L. M. WIEDER: I thought that one lesion on the lateral surface of the left calf was suggestive of erythema induratum, and think that this diagnosis should be considered. The biopsy was not deep enough to show the pathologic changes in the deeper lesions.

DR. A. W. STILLIANS: We showed a patient a few years ago, a negress, with a similar condition, which we called erythema induratum, but we decided afterward that it was not that disorder. This impressed me as the same sort of case, a thrombosis with a secondary ulceration.

DR. CLARK W. FINNERUD: I wish to urge everyone, whenever erythema induratum is suspected, to take a biopsy that includes at least the upper half of the hypoderm. I think that the case is probably one of erythema induratum.

DR. U. J. WILE: I could not see erythema induratum in this case. I did not think that there was any erythema, and the masses were far too large. I thought that it was precisely the way the edematous state of scleroderma would be, and I think that the diagnosis of scleroderma is at least a hypothesis that should be considered.

DR. F. E. SENEAR: We were rather interested in this case because of the recent report in the *French Journal of Dermatology* of a case clearly of scleroderma with the histopathologic picture of tuberculosis. We were not willing to make a diagnosis of scleroderma. The skin was shiny, but we felt that possibly the infiltration might represent the edematous stage of scleroderma. The lesions on the right ankle, which have now involuted, appeared clinically to be those of folliclis, and the patient had the type of circulation in which one might expect lesions of that type. The biopsy was not deep enough. It was taken right over the bone, but we shall get another from the deeper part lateral to the tibia. I have no definite diagnosis now, but think that it rests between the two conditions mentioned.

A CASE FOR DIAGNOSIS (PEMPHIGUS? LUPUS ERYTHEMATOSUS?). Presented by DR. O. S. ORMSBY.

A woman, aged 63, had a disorder of one year's duration. The principal portion of the disorder was situated in the scalp, where there were marked loss

of hair and some cutaneous lesions. The nature of the early lesions could not be ascertained. The patient said that they were blisters, but her observation was very inaccurate. The gums were involved simultaneously with the scalp, and at a later date lesions of the same sort appeared on the upper part of the trunk and the extremities.

At the time of presentation the entire groin was devoid of hair. There was much atrophy. Scattered throughout the area were crusted patches of varying size. The atrophic scalp was white. There was no inflammatory reaction outside of the crusted patches. The gums were red and spongy, and the teeth were carious. The mucous membrane of the mouth was otherwise normal. On her first visit to the hospital, a vesicle was seen and a large number of excoriations were present over the upper portion of the back. The differential blood count showed: polymorphonuclears, 73 per cent; lymphocytes, 22 per cent; transitionals, 3 per cent, and eosinophils, 2 per cent.

DISCUSSION

DR. E. P. ZEISLER: The condition of the scalp suggests erythematous lupus. The other features, particularly the involvement of the mouth, fit in more with Dr. Senear's disease.

DR. P. A. OLEARY: The patient has a chronic, benign type of pemphigus, complicated with lesions characteristic of lupus erythematosus. The six or seven cases of "Senear disease" that I have seen are essentially a chronic type of pemphigus with secondary toxic features of lupus erythematosus. The patient informed me that she had had lesions on the vulva during the summer which healed spontaneously. While discussing pemphigus, I should like to call attention to the frequency with which the disease starts as a single bullous lesion, which may persist for several months about the nose or mouth. The usual local therapeutic measures fail, and the course of the disease is usually rapid when generalization takes place.

DR. CLEVELAND WHITE: Is alopecia a common observation in this disorder?

DR. F. E. SENEAR: I think that this type of pemphigus should be called the Ormsby type. This case was of interest to me because I saw one of Dr. Oliver's patients, who presented only a large exudative lesion of the scalp, about the size of a baby's palm. It was absolutely refractory to all types of treatment. Shortly afterward, a patch developed underneath the right eye. There was nothing in the picture to suggest pemphigus. She had alopecia. Answering Dr. White's question, I do not think that the alopecia was permanent. The patient came to see me again a few days ago and had developed several lesions in the mouth, although the original picture would not call to mind pemphigus. In view of the fact that this patient has had lesions on the genitalia and on the back, which have now disappeared, I think that the case possibly falls into the atypical group, although it has been present only about one year and it may become necessary to look on it as a true pemphigus later.

DR. O. S. ORMSBY: This patient's picture, as a whole, is not like the other cases that have been discussed. Patients in that group have combined symptoms of lupus erythematosus, pemphigus and seborrheic dermatitis. This patient has symptoms of lupus erythematosus and pemphigus. However, in spite of the absence of seborrheic lesions, I think that the case might be placed provisionally as a benign type of pemphigus. It is possible in the beginning to have only one of the three dermatoses present. This was exhibited in a patient whom I saw about two years ago. He had seborrheic dermatitis of the face for several months without other symptoms and then rather suddenly a generalized typical pemphigus developed and he died within a few months.

DR. P. A. O'LEARY: That patient was given several transfusions of whole blood, following which the disease assumed malignant features. We have had a similar experience in three other patients.

LEPROSY (MACULO-ANESTHETIC TYPE). Presented by DR. B. BARKER BEESON.

A man, aged 23, born in Mexico, six months before presentation was burned while at work in a steel mill, but he suffered from no pain following the injury. He was seen four months later by a physician, who suspected leprosy because of complete anesthesia of the spots over the face and forehead, for which the patient consulted him. Similar lesions, principally over the trunk, also showed complete anesthesia. There was no nasal discharge.

At this time there were a number of faintly reddish, well defined patches over the trunk, face, forehead, arms and legs, which were completely anesthetic. The anesthesia extended up over the lower third of the arms and legs, and also affected the face, which the patient described as feeling dead. There was a painless bilateral enlargement of the ulnar nerves, and early atrophy of the interossei muscles was present over the backs of the hands.

DISCUSSION

DR. CLARK W. FINNERUD: In referring to the light brown eruption on the chest, Dr. Harry Foerster said that he thought that it was pityriasis versicolor, and I agree with that suggestion.

DR. J. H. MITCHELL: I looked for the areas which Hopkins says are spared by leprosy and found them all free — the mastoid region, the webs of the fingers and the gluteal folds.

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CONTENTS

PAGE

TRICHOPHYTON PURPUREUM (BANG) AS A DEEP INVADER OF THE SKIN: REPORT OF A CASE. JOHN H. HARRIS, M.D., AND GEORGE M. LEWIS, M.D., NEW YORK 1

SIGNIFICANCE OF MYCOLOGY IN TROPICAL MEDICINE. BAILEY K. ASHFORD, M.D., SAN JUAN, PORTO RICO 7

THE GROWTH OF HAIR IN NEWLY BORN ALBINO RATS. JAY F. SCHAMBERG, M.D., AND ELI SALZBY, M.D., PHILADELPHIA 34

EPIDERMOPHYTOSIS OF THE FEET AND EPIDERMOPHYTIDS OF THE HANDS: CLINICAL, HISTOLOGIC, CULTURAL AND EXPERIMENTAL STUDIES. SAMUEL M. PECK, M.D., NEW YORK 40

TREATMENT OF LUPUS ERYTHEMATOSUS BY INTRAVENOUS INJECTIONS OF GOLD CHLORIDE. H. HAXTHAUSEN, COPENHAGEN, DENMARK 77

THE USE OF SOLUTION OF PITUITARY IN HERPES ZOSTER. D. M. SIDLICK, M.D., PHILADELPHIA 91

THE FINDING OF THE LARVAE OF THE CHIGO, TUNGA PENETRANS, IN SCRAPINGS FROM HUMAN SKIN: REPORT OF A CASE. ERNEST CARROLL FAUST, PH.D., AND THOMAS ANDREW MAXWELL, M.D., NEW ORLEANS 94

THE NATURE OF MELANOMA: REPORT OF A CURED CASE. OSCAR L. LEVIN, M.D., AND SEYMOUR H. SILVERS, M.D., NEW YORK 98

LEPROSY: TREATMENT BY MEANS OF A SPECIAL VACCINE. A. WINKELRIED WILLIAMS, M.B., C.M., D.P.H., PARKSTONE, DORSET, ENGLAND 109

BIOGRAPHY:

ÉMILE VIDAL. B. BARNES BERSON, M.D., CHICAGO 115

CORRESPONDENCE:

PIGMENTED ATROPHIC SCLERODERMA. FRED WISE, M.D., NEW YORK 120

ABSTRACTS FROM CURRENT LITERATURE 121

SOCIETY TRANSACTIONS:

SAN FRANCISCO DERMATOLOGICAL SOCIETY 129

DERMATOLOGICAL CONFERENCE OF THE MISSISSIPPI VALLEY .. 139

CHICAGO DERMATOLOGICAL SOCIETY 169

INDEX TO CURRENT LITERATURE 195

DIRECTORY OF DERMATOLOGIC SOCIETIES 198